13 Industry and Methods Reports in This Issue.

April, 1961

ROADS AND STREETS

A GILLETTE PUBLICATION

UNIVERSITY MICROFILMS
EUGENE B. POWER
313 N. 1ST ST.
ANN ARBOR, MICH.
CONP-TRAV-11-SO

RENT A JACKSON

IT'S A SOUND, NO-RISK WAY OF DISCOVERING THE FASTEST, MOST EFFECTIVE AND BY FAR THE MOST INEXPENSIVE METHOD OF COMPACTING GRANULAR SOILS; BASE COURSES, FILLS AND SOIL-CEMENT MIXES.

Changing from the 13 ft., 3 inch working width to 88 inches overall for road travel or maneuverability on the job is accomplished hydraulically in just 30 SECONDS.

The new widening attachment (optional at added cost) is raised or lowered instantly. Makes the JACKSON by far the most efficient compactor for widening projects.

As one contractor on a federal highway project put it: "We rented this vibratory compactor from our dealer just for this job, but we're so pleased with its performance that we'll probably buy it. It has the versatility and punch to handle all our compacting, both big and small jobs, on slopes and level ground — QUICKLY."

VERSATILITY? Look at the illustrations. Then consider, too, that the individual compactor units may be fitted with operating handles and used as self-propelling units to compact the tight places other equipment can't touch. Also that the JACKSON operates in either direction, no deadheading or turning around is required.

PUNCH? 4200 3-TON BLOWS PER MINUTE from each of the compactor units provide extremely high productivity. 100% of specified density is frequently attained in a single pass. And the JACKSON does not leave the top 1-inch of the lift in a loose condition . . . a very important consideration. Maintenance and operational costs are extremely low.

Discover the outstanding time-and-money-saving opportunities afforded by the JACKSON MULTIPLE COMPACTOR by renting one from your Jackson Distributor. Name and further details on request.

. . . for more details circle 327 on enclosed return postal card

JACKSON VIBRATORS, INC.

LUDINGTON, MICHIGAN

Bethlehem announces . . .

11

NEW LIGHTWEIGHT WIDE-FLANGE BEAMS!

. . . for still greater economy in steel construction

Steel

for Strength Economy Versatility

These new sections, combined with the new ASTM Specifications for higher-strength steels (A36, A440, A441), will provide still greater flexibility and economy in steel construction.

- Seven new lighter weights for wide-flange beams currently produced. These average 8 to 11 per cent less weight per foot than the present lightest weights!
- Four new light beams increasing Bethlehem's BL series to 14-in. and 16-in. nominal depths!
- All immediately available from regular rolling schedules!

free booklet gives all details

BETHLEHEM STEEL

PUBLICATIONS DEPARTMENT
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

Please rush me a copy of Booklet 582, "11 NEW LIGHTWEIGHT WIDE-FLANGE BEAMS."

Name .....
Company .....
Address .....
City ..... *Zone* .... *State* .....

Export Sales: Bethlehem Steel Export Corp., 25 Broadway, New York 4

. . . for more details circle 285 on enclosed return postal card

ROADS AND STREETS APRIL, 1961

HIGHWAYS • BRIDGES • AIR FIELDS • HEAVY CONSTRUCTION

Industry Affairs
19 Washington Newsletter
59 Better Climate for Contractors, AGC Convention Theme
70 Road Program "Looking Up"

Special Notice
31 Charles T. Murry, Managing Editor, Passes

Contractor Management, Equipment Utilization, Job Methods
56 Water for Super-Hot Desert Freeway Job
60 Big Viaduct Job Puts Contractor in Prestressing Business
74 Desert Survival Test for Tomorrow's Better Equipment
79 Flying Machinery Salesman
82 "Know Your Equipment" Symposium (ARBA Convention)
94 Earthmoving—Mostly About Scrapers—II
102 Paving Methods Adapted to Hard Stone, Temperature Range

Engineering, Technical, Maintenance
66 How Improved Paper Curing Helps Get Better Concrete
115 Colorado Upgrades Gravel Hot Mixes With Lime
126 With AAPT at Charleston

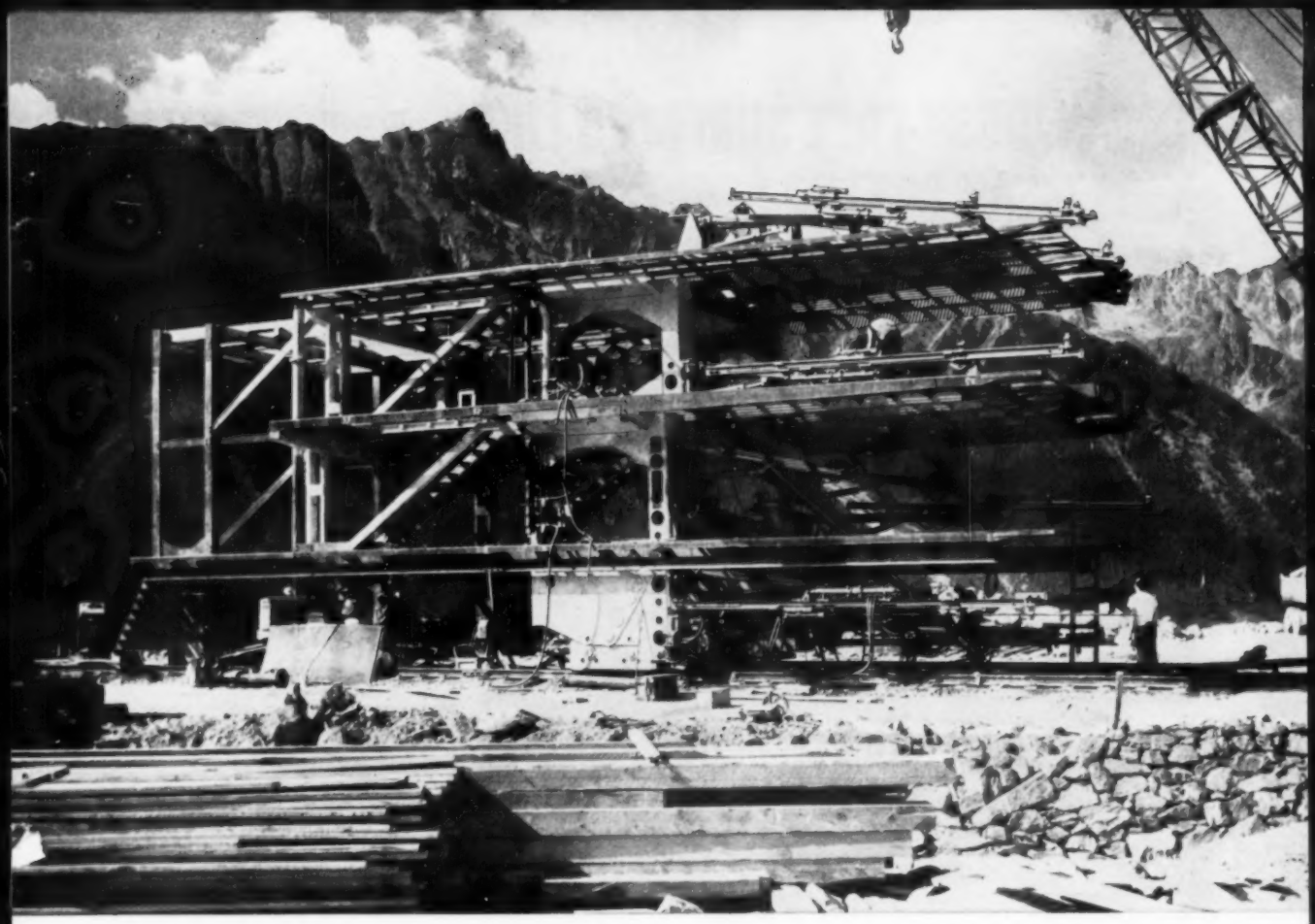
Departments
36 People
42 New Publications
55 Editorial (Contract Volumes and Profits)

Where to Buy It
130 Reader Inquiry Card
130 New Products
175 Manufacturers' Literature
177 With the Manufacturers and Distributors
163 Clearing House (Used Equipment Advertising)
178 Advertisers' Index

FRONT COVER SCENE

Little dust despite heavy fines and high production volume has been the accomplishments at this asphalt plant. It is a Barber-Greene Batchomatic assembly owned by V. R. Dennis Construction Co. of San Diego, Calif., a city having stringent air pollution laws.

Accepted as Controlled Circulation Publication at Milwaukee, Wisconsin. Published monthly. Subscription $6.00 per year ($7.00 foreign.) Form 3579 requested to be returned to Gillette Publishing Company, 22 W. Maple St., Chicago.



15-Drill Hydra-Boom Jumbo at MONT-BLANC TUNNEL

Fully mechanized I-R tunneling rig spearheads drilling from French side of new vehicular bore through the Alps

Using one of the largest and most modern boom jumbos ever built, the French side of the new Mont-Blanc tunnel got off to a fast start with workmen waging a winning battle against Europe's highest mountain. Completion by a group of French contractors, headed by Entreprises de Travaux Publics André Borie, is expected on schedule in 1962.

The huge four-level gantry-type jumbo mounts fifteen 3½" bore I-R drifters on I-R Hydra-Booms that provide complete hydraulic positioning for all drills. It was built in Lyon, France, by Ferrand & Frantz, and Entreprises de Travaux Publics André Borie. Fourteen-foot blast holes are drilled without steel changes, using 1¾" Carset bits. A burn hole is put in each round by an I-R Downhole Drill with an 8" Carset bit, to permit pulling longer rounds. The hydraulic cylinders of all 15 Hydra-Booms are operated from 5 hydraulic pumps driven by I-R air motors.

Wherever fast, effortless hole spotting is required for tunnel or mining operations, I-R Hydra-Booms, drifters and feeds provide a cost-cutting combination that pays off in faster, more efficient drilling. Ask your Ingersoll-Rand engineer for complete information.

Ingersoll-Rand
105A5 11 Broadway, New York 4, N.Y.

A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK

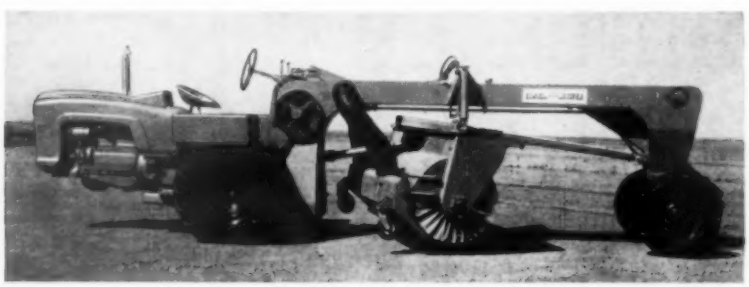
. . . for more details circle 326 on enclosed return postal card

CLEAN, DUST-FREE SURFACES LIKE THIS MEAN BETTER SEAL COATING

...yours with FLAHERTY BROOM-MASTER

Here's what one contractor recently said about Broom-Master — "We used it to prepare runways on a large airport job. The blower feature provides clean, dust-free surface good seal coat work demands, and I was particularly impressed with the broom's ability to move excessive chips that accumulate to the side of the machine. Broom-Master is well-balanced, fast and maneuverable — something construction has needed for a long time."

And on this job the machine showed only ¼" of broom wear after 36 hours of constant use. Here's why Broom-Master is the efficient, low-cost answer to cleaner surfaces:



■ **Positive broom setting**— insures minimum core wear — tips of bristles do all the work.

■ **Ampli-Torc drive** — provides choice of 12 working speeds.

■ **Built-in blower**— applies broom width jet air stream at proper place, assures efficient clean sweep.

■ **See your Flaherty distributor or write for new, complete bulletin.**

Flaherty Manufacturing, Inc. Branch
Buffalo-Springfield Co.
Pocatello, Idaho

A Division of KOEHRING Company

. . . for more details circle 330 on enclosed return postal card

ROADS AND STREETS

Devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; the construction and maintenance of airports. Represents 69 years of continuous publishing in the highway field; combined with Engineering and Contracting and Good Roads Magazines, established in 1892.

HAROLD J. MCKEEVER, *Editorial Director*

JAMES R. CUMMINGS, *Associate Editor*

FRANK REID, *Associate Editor*

DUANE L. CRONK, *Washington Editor*

DOUGLAS MCDONOUGH, *Assistant Editor*

HELENA JUNG, *Production Editor*

BERNARD A. WEDELL, *Products Editor*

GEORGIA ZOGRAFOS, *Editorial Secretary*

JAMES P. APROBERTS, H. K. GLIDDEN, H. G. NEVITT, R. L. PEURIFOY, *Contributing Editors*

BPA

Gillette Publishing Company
A Subsidiary of
The Reuben H. Donnelley Corporation

Publication and Editorial Offices:
22 West Maple Street, Chicago 10, Ill.

Chicago Office: 22 West Maple St. Superior 7-1581. R. T. Wilson, Gen. Sales Manager; Fred H. Bowes, Representative; E. Bender, Clearing House Manager; J. L. Latta, Production Manager; L. R. Vickers, Circulation Manager; A. W. Lehmann, Research Director.

New York Office: 15 E. 40th St., New York 16, N. Y., Oregon 9-7750. F. A. Michel Jr., Eastern Manager.

Cleveland Office: Trace Building, 3100 Wooster Rd., Cleveland 16, Ohio, Edison 1-2267, Ray Keine, Manager.

West Coast Office: 1126 Del Rey, Pasadena, Calif., Sycamore 4-6328, J. A. Osborne, Manager.

Officers: Curtiss E. Frank, Chairman of the Board; Hamilton B. Mitchell, President; Edward A. O'Rorke, Vice President; Fred C. Ash, Secretary-Treasurer and General Counsel; Karl G. Clement, Controller.

Gillette Publishing Company
HALBERT S. GILLETTE,
Vice President and Publisher

OTHER GILLETTE PUBLICATIONS

Rural Roads • Street Engineering World Construction • Caminos y Construcción Pesada

UP And RUNNING In 16 Hours..

Automaster-CA Paving Plant

Here's a one-stop paving plant that starts batching profit in as little as 16 hours after components arrive. All parts of the plant package are pre-assembled into easy handling, compact units that meet road limits for truck transport. Maximum lift is about 7½ tons.

What About Batching?

The Automaster-CA weighs out a 1½-cu. yd. paver batch every 15 seconds! Plant has three 38 cu. ft. (3000-lb. scale) aggregate batchers, one 14 cu. ft. (1000-lb. scale) cement batcher. All are air-ram operated, fully automatic — have centralized controls, electric interlocks, and beam boxes with balance indicators.

To meet U. S. Engineer specifications, batching equipment can be furnished with dial scales, 12-mix selector system, graphic pen recording, time and date stamp, interlocks, and aggregate moisture compensating beams. Ask your Johnson distributor for details.

C. S. JOHNSON COMPANY
CHAMPAIGN, ILL., STOCKTON, CALIF.

A Division of KOEHRING Company

... portable, stack-up design speeds assembly

37

Batchers, dial scales and control console are combined into one compact unit — install in one lift. Plug-in control connections eliminate complex field wiring.

Divided material bin stacks above batchers. Holds 100 cu. yds. aggregate (150 tons @ 3000 lbs. per yd.) — 145 bbls. cement (@ 4 cu. ft. per bbl.)

Next, cement elevator complete with head platform, access ladder, and safety cage goes up. Chain and bucket-line capacity: 440-bbl.-per-hour.

Lower undertrack screw conveyor into place, add silo, and bring on the trucks! Silo with aeration system, high-low-level signals, etc. Holds 447 bbl.

. . . for more details circle 331 on enclosed return postal card

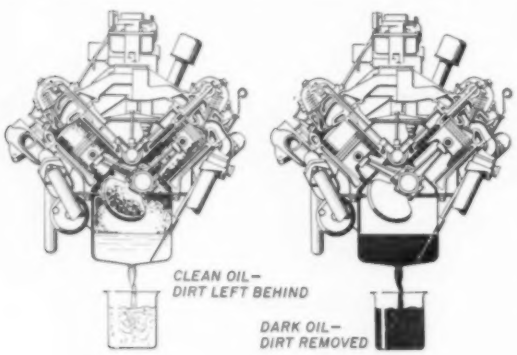
LUBE LOGIC 5 new ways

Warm bath restores wire rope

The best way to get lubricant inside a cable, where it's really needed, is to immerse the cable or wire rope every 500 hours or so in a bath of warmed-up Texaco Crater A lubricant. It pays off by giving you far longer service life than you would get simply by applying Crater A externally.

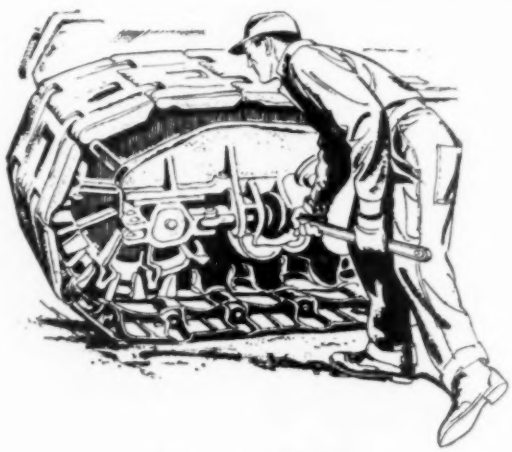
This warm-bath treatment requires a horizontal trough to hold the lubricant. The trough should be fitted with pulleys to keep the cable completely submerged while it's passing through. A burlap collar should be rigged to wipe off excess lubricant as the cable leaves the box. An immersion of about a minute will allow the lubricant to work well into the strands.

This process is *not* an alternative to other lubrication. You should continue to clean the cable and apply Crater A externally every 10 to 100 hours, depending on the type of work the cable is doing. Remember also to be very sparing with lubricants on cables that wind on clutch-equipped drums, and never lubricate cables that are dragged in dirt.



Dark engine oil . . . sign of a hard worker

Here's a motor-oil misconception that's still common enough to need discussion. Some folks think that the better an engine oil is, the more likely it is to come out as clean as it went in. The truth of the matter is just the other way around. A good detergent-dispersant oil holds onto dirt like an old friend. It keeps dust, soot and carbon in suspension, and carries it out of the engine when you drain the oil. Oil that looks clean when you drain it from the crankcase is a sign that these contaminants may still be inside the engine. Moral: oil that darkens in use is really doing its job.



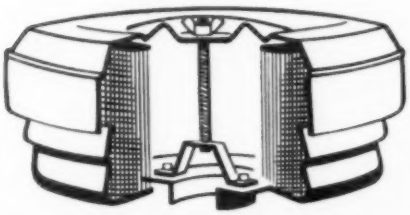
No-sweat way to adjust crawler treads

Crawler treads are easier to adjust if you dab a little Texaco Threadtex on the adjusting screws. The Threadtex stays put through months of service, keeps the screws free-turning and corrosive-proof. Another good use for Threadtex is on track bolts, when you're making up track. A little dab of Threadtex on the bolts will save a lot of time and work in taking down track after it has been in service.

to trim downtime

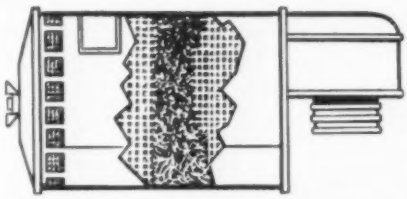
Key points on air filter maintenance

In a day's operation a typical engine inhales several thousand cubic feet of air, and on a construction project all that air is probably loaded with abrasive dirt and dust. Good air-filter maintenance is the only way to make sure your engine gets the air and *not* the dirt. Here are some maintenance tips that will keep your air filter working better through thick and thin.



Dry type air cleaners (the ones with the fluted paper element) should simply be shaken or tapped lightly to remove dirt, and reinstalled. Never clean dry-type elements with kerosine or diesel fuel.

Additional precautions: empty centrifugal precleaners when the glass container is half full; don't remove the oil cup when the engine is running.



If your filter is the wire gauze type, and you want to re-use the element, wash the gauze in kerosine or diesel fuel, shake it dry *(don't* blow it with compressed air) and re-oil it with SAE 40 or SAE 50 oil to coat the element.

Oil-bath type air filters won't function properly if there's more than a half inch of sediment at the bottom of the oil reservoir. Check the sediment level by sticking a screw-driver down into the oil, and if you're anywhere near the half-inch level the bowl should be cleaned out and refilled. Also, inspect the filter every 5 to 50 hours to make sure the oil itself is at the right level. Every 500 hours the whole cleaner should be dismantled and cleaned, and refilled with new engine oil of the same grade used in the crankcase.

New Texaco movie can help boost your profits

This factual, down-to-earth presentation shows you how 1% of your total budget (the amount usually spent on lubricants) can minimize a major cause of equipment downtime.

SEE: How the biggest engineering job ever undertaken was 90% lubricated with only *four* different products.

SEE: How one contractor lubricated 21 different types of equipment with only seven products.

SEE: "When the Wheels Stop, Your Profits Go" – Texaco's newest sound and color movie.

FOR AN EARLY SHOWING contact your Texaco Contractor Representative *now.*

TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers"—little angles, so easy to overlook, where big savings in time and money can be made. But month in, month out, your local Texaco Man is your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

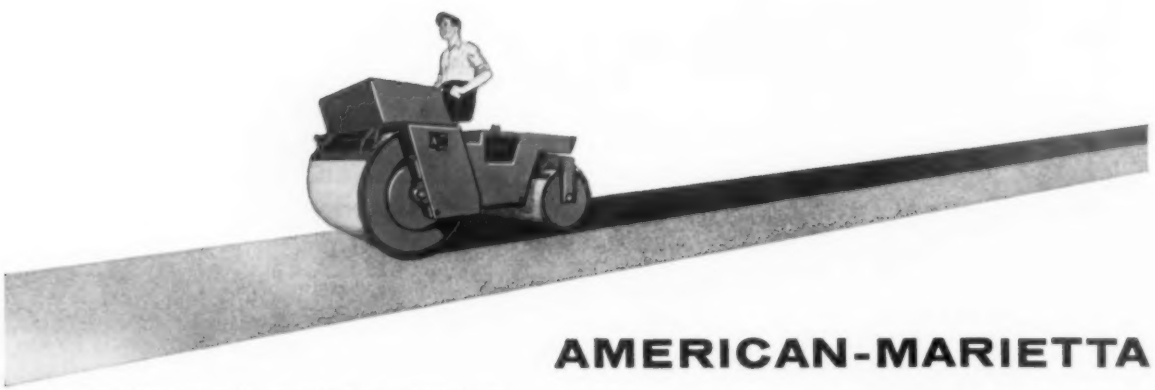
TUNE IN: TEXACO HUNTLEY-BRINKLEY REPORT, MON. THROUGH FRI.—NBC-TV

TEXACO

Throughout the United States

Canada • Latin America • West Africa

WHAT'S so good about the new AMROL steel wheel? Many things . . . its ability to work tight up to curbs . . . its excellent visibility . . . but the thing that really sets it apart from all other rollers is its Hydrostatic drive. Here's a drive that gives you single-lever control of direction, speed and braking. It provides stepless speed control from 0 to 5 mph . . . maintains the speed you select uphill or down . . . and develops maximum torque over the entire speed range. Hydrostatic drive is exclusive in the new 3- to 5-ton and the portable 4- to 6-ton AMROLS . . . exclusive and well worth investigating. Let your A-M distributor give you the full story, or write American-Marietta Company, Construction Equipment Division, Milwaukee 1, Wis.



AMERICAN-MARIETTA

. . . for more details circle 280 on enclosed return postal card

Job records prove Firestone's

2-WAY PLAN KEEPS PAYLOADS MOVING!

1. **Firestone Giant Tires** help you keep the cycle going with minimum downtime losses. Firestone off-the-highway tires are toughened by Shock-Fortified nylon cord to resist impact. With exclusive Firestone Rubber-X they're the longest-wearing Firestone off-the-highway tires ever built.

2. **Firestone Giant Tire Service Experts** match and fit Firestones to your equipment, large and small, for top on-the-job performance. And it never ends! These men provide 24-hour maintenance for every Firestone tire on the job.

To learn how this 2-Way Giant Tire Plan helps cut operating costs see your Firestone Dealer or Store. Or, write: Manager, Off-The-Highway Tires, The Firestone Tire & Rubber Company, Akron, Ohio. **Always Specify Firestone Tires When Ordering New Equipment.**

Tune in Eyewitness to History every Friday evening, CBS Television Network

Firestone

BETTER RUBBER FROM START TO FINISH

Copyright 1961, The Firestone Tire & Rubber Company

. . . for more details circle 303 on enclosed return postal card

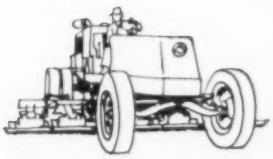
THE USEFULNESS OF A ***LIMA AUSTIN-WESTERN***

ONE MAN RUNS THIS PORTABLE PUSHBUTTON CRUSHING PLANT

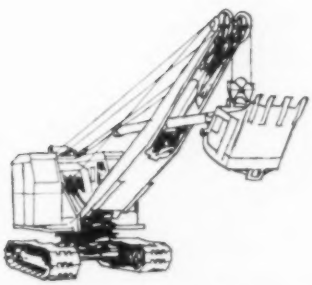
Only one man is required to operate this Lima Austin-Western portable crushing and screening plant. From his operating platform he can see and control every phase of this efficient, high-speed setup. Diesel engine operates crushers; electric generator powers all other operations. Design simplicity eliminates troublesome clutches, chains, sprockets and gearboxes. Maintenance is reduced, tonnage costs are kept down.

And look at the compactness of this completely portable unit. It's self-contained, rubber mounted—ready to roll from job to job. Works near end-use sites to cut trucking time and costs. Lima Austin-Western offers a full line of portable or stationary crushing, screening and washing equipment, including jaw crushers, roll crushers, feeders, screens, elevators, conveyors and bins. To see it in action, get in touch with our distributor nearest you or write to us for full details.

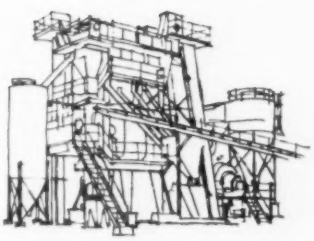
6102



LIMA MODEL D ROADPACKER
—Six vibrating shoes compact fast and deep for profitable single-course construction; available in 12-shoe Super model.



LIMA SHOVELS AND CRANES
—Interchangeable front ends. Shovels to 8 yd.; cranes to 140 tons on crawlers, 80 tons on rubber; draglines variable.



LIMA MADSEN ASPHALT PLANTS
—available in models with batching capacities from 1000 to 10,000 lb.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA AUSTIN-WESTERN Crushing, Screening and Washing Equipment

BALDWIN · LIMA · HAMILTON

CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO

. . . for more details circle 283 on enclosed return postal card

EUCLID
all-wheel drive . .

. . . pays off in all-job versatility!

For high productive capacity and all around work-ability Euclid "Twins" are way ahead of other scrapers of comparable size. No matter what your scraper requirements may be—"mountain goat" climbing ability, pushing through high rolling resistance sand and heavy going, or working in good dirt—all-wheel drive "Eucs" get more work done on every job.

Both the TS-14 and TS-24 have proved outstanding performers and big producers on a wide range of work from big yardage projects to smaller jobs. With separate Torqmatic Drives and power trains for each axle, these "Eucs" work on grades and under adverse job conditions that stall other scrapers. Each is a one-man earthmoving spread that can work without a pusher tractor . . . each has plenty of power and traction to pick up a heaped load in a hurry . . . pull out of the pit fast . . . and really highball on the haul to the fill and return.

If you want 14 or 24 yd. scrapers (20 and 32 yds. heaped) that can work more days per year . . . that can handle more kinds of work and give you bigger production . . . ask your dealer for the facts and figures that show why all-wheel drive Euclid "Twins" give you a better return on your investment.

EUCLID **Division of General Motors, Cleveland 17, Ohio**

Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

◀ ***TS-14*** *296 total h.p. . . . struck capacity of 14 yds. . . . 4-speed Torqmatic Drives with converter lock-up.*

TS-24 *563 total h.p. . . . capacity of 24 yds. struck, 32 yds. heaped . . . 27.00 x 33.5 tires with 33.5 x 33 optional.* ▶

GM GENERAL MOTORS EUCLID

EUCLID

FOR MOVING EARTH, ROCK, COAL AND ORE

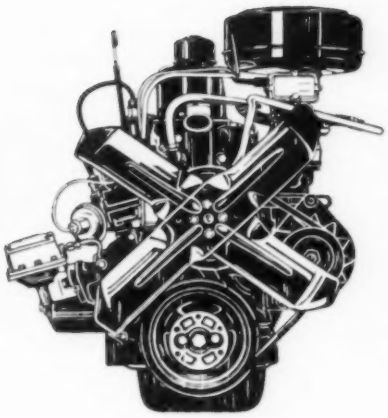
THE NEWEST REASON TO MAKE YOUR NEXT 2-TONNER A FORD

ALL-NEW FORD BIG SIX

262 CU. IN. TRUCK ENGINE

FORD DIVISION, Ford Motor Company

New two-ton toughness! New stronger frame...huskier cab...rugged truck suspension that can give twice the front tire life of other types!



Now, the rugged simplicity of a big 262-cubic-inch Six is combined with the dependability of heavy-duty, *exclusive-truck* engine design. In a grueling 40,000-mile test of reliability, Ford's new Big Six was pitted against its principal competitor in the 2-ton field. Result: Ford's new engine required far fewer service adjustments. This means less time in the shop . . . more time on the job.

The new Big Six is one of *four* engine choices in Ford two-tonners for '61—including America's most popular truck V-8's. See your Ford Dealer. He will be glad to help you select the best engine for your job.

SEVEN MORE REASONS

WHY IT'S GOOD BUSINESS TO DO BUSINESS WITH FORD!

You save from the start with Ford's traditionally low prices! And your savings continue with lower operating and maintenance costs. These facts are documented by certified test reports from America's foremost independent automotive research firm. Ask to see these reports. They're on file at your Ford Dealer's.

In addition to these actual dollar-and-cents savings, the following bonus benefits provide greater protection against those annoying problems that are often associated with truck ownership.

1. **Rigid quality controls** give you the strongest safeguard of truck quality ever. One tangible result of these new and uniformly high standards is Ford's liberal new warranty program. Other results: extended durability and performance, lower operating costs.

2. **12,000-mile warranty** (or 12 months) on *all* 1961 Ford Trucks of any size. Each part, except tires and tubes, is now warranted by your dealer against defects in material or workmanship for 12 months or 12,000 miles, whichever comes first. The warranty does not apply, of course, to normal maintenance service or to the replacement in normal maintenance of parts such as filters, spark plugs and ignition points.

3. **Exclusive 100,000-mile warranty** (or 24 months) on 401-, 477- and 534-cu. in. Super Duty V-8 engines. Each major engine part (including block, heads, crankshaft, valves, pistons, rings), when engine is used in normal service, is warranted by your dealer against defects in material or workmanship for 100,000 miles or 24 months, whichever comes first. Warranty covers full cost of replacement parts . . . full labor costs for first year or 50,000 miles, sliding percentage scale thereafter.

4. **Special fleet financing,** available for owners of two or more trucks, provides the opportunity to precisely tailor payments to your income patterns or depreciation schedules. Let your Ford Dealer explain how this fleet truck finance plan offers substantial savings and frees your working capital.

5. **36 district offices** staffed with sales engineers and service specialists are on call for special truck problems. Working with both dealers and customers, these experienced truck men represent another extra step Ford takes to provide your continued satisfaction.

6. **Replacement parts depots** at 26 strategic locations across the country quickly supply needed parts from ample stocks. Ford's entire supply system is geared to give you faster service and reduce costly downtime . . . *wherever* you are.

7. **6,800 Ford Dealers,** including 273 specialized Heavy Duty truck dealers, can keep your trucks ready to go wherever they go. From coast to coast, fast Ford service—gas *and* Diesel—is always close at hand.

From Super Economy pickups to Diesel-powered tractors, you can now fill every truck need up to 76,800 pounds GCW with a modern, money-saving Ford Truck.

FORD TRUCKS COST LESS

SEE YOUR FORD DEALER'S "CERTIFIED ECONOMY BOOK" FOR PROOF!

. . . for more details circle 301 on enclosed return postal card

"40,000 cu. yds. loaded out in record time"

. . . say field reports about these two BAY CITY shovels. Owned by K & R Construction Co. of Camillus, N. Y., they are loading bank run gravel for use as sub-base material on the Empire Stateway Interstate Route at Syracuse. Fourteen trucks are needed to keep up with the two machine's output of 2300 to 2500 cubic yards per 8-hr. day.

You can't help admiring a BAY CITY'S digging ability. Smooth, balanced power is provided through a fluid coupling and speed reducing unit of helical cut gears running in oil. A one-piece continuous chain with automatic adjuster gives positive, powerful and independent crowd action. Power-operated retract is twice as fast as crowd . . . provides positive control of dipper handle throughout the dig-swing-dump cycle. Mechanical power-controlled boosters set the main

drum clutches with minimum effort. Smooth acting swingers are engaged through needle bearings on hardened tapered keys — a combination that means quick response, fast swing.

BAY CITY crawler machines are offered as ¾- to 1½-yd. convertible excavators and as 20- to 30-ton erecting cranes. Truck-mounted CraneMobiles, with lifting capacities of 25- to 40-ton, are also available. Ask your local BAY CITY dealer to give you the complete story. Do it today!

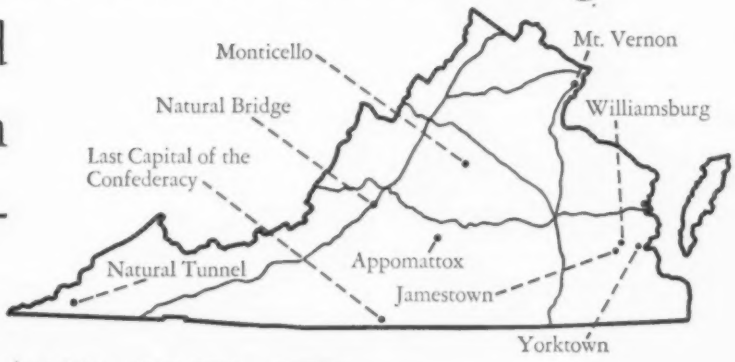
BAY CITY SHOVELS, INC.
2611-C Center Avenue
BAY CITY, MICHIGAN

a subsidiary of Unit Crane & Shovel Corp.

. . . for more details circle 284 on enclosed return postal card

In the 1780's it took Thomas Jefferson's coach-and-four about five days to travel the 100 miles from Richmond to Alexandria, Va. Today it takes about two hours. The difference is modern horsepower and 100 miles of four lane highway.

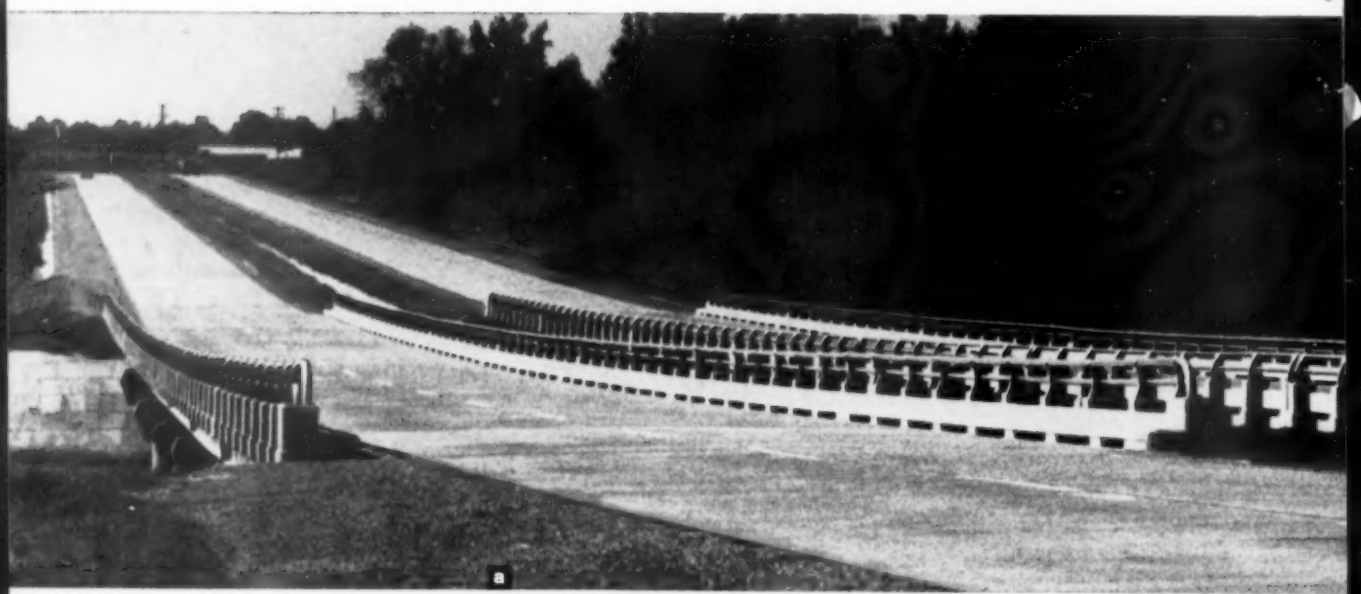
In 1961, more than 1,000,000 tourists will visit some of the Nation's oldest landmarks in Virginia. And they'll travel on some of the Nation's newest highways because Virginia is spending about $76,000,000 in Federal aid funds on its Interstate Highway program. This, in addition to two bond issue projects: the Richmond-Petersburg Turnpike and the Hampton Roads Bridge-Tunnel. For more details, turn page.



Steel Products are the backbone of Virginia's Interstate Highways

Virginia has more than 25,000 miles of hard surfaced roads right now and they're building more. Proposed for construction are 1,053 miles of four lane, controlled access Interstate Highways. This is Virginia's part of the Nation's 41,000 mile Interstate Highway Program. In Virginia, over 80 miles of the Interstate system are in use and 250 of the proposed 2,263 bridges have been built. This work is under the direction of State Highway Commissioner Howard H. Harris and Francis A. Davis, Chief Engineer and Deputy Commissioner.

Millions of feet of steel reinforcing bars criss-cross through the concrete to lock strength into the roadway. Each bridge is designed to take advantage of the strength and economy of steel. USS High Strength and carbon structural steels are effectively combined for minimum bridge weight and maximum clearance. USS "T-1" Constructional Alloy Steel and USS MAN-TEN, TRI-TEN and COR-TEN High Strength Steels are used in bridges where more load capacity, less dead weight and higher corrosion resistance is needed. USS Galvanized Culvert Sheets carry thousands of streams harmlessly under embankments. USS AMERICAN Fencing protects right-of-way and


a

b

c

d

USS Highway Beam Guardrail provides safety protection at critical points along the roadway. Steel is also used for driving aids, markers and lighting standards. The *strength* of the Virginia Interstate Highway Program is *steel.*

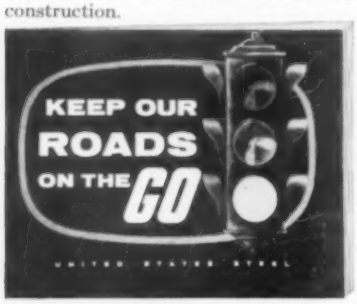
a The design of each bridge is based on the strength of steel. Bridge railings, reinforcing bars and structural members are all made from steel. **b** Highway guard rail. USS AMERICAN Highway Beam Guardrail has been accepted by most state highway departments because of its extra strength, high visibility and attractive styling. **c** Giant steel auger drills through toughest terrain in all seasons. USS High Strength Steels have the toughness and impact resistance it takes for heavy construction equipment. Steel is so versatile it is used in all types of construction equipment for lightweight and heavy duty applications. **d** Road embankments are saved from costly erosion with steel culverts fabricated from corrugated galvanized USS Culvert Sheets. Culvert sheets assemble easily and first cost is low. They make an ideal economical and strong waterway channel. **e** Steel H-piles are driven to provide solid foundations for bridge piers and abutments. Cranes equipped with USS TIGER BRAND Wire Rope handle more work with less down time. USS TIGER BRAND—America's No. 1 Wire Rope always gives top performance under the most severe conditions. **f** Bridge railings, reinforcing bars and structural members are all made from steel. **g** Steel gives strength to bridges and provides safety protection when it's formed into guardrails. **h** Strong roadways are made with reinforced concrete. USS AMERICAN Welded Wire Fabric has a minimum tensile strength of 75,000 psi and a minimum yield point of 60,000 psi, available in a wide range of styles and sizes. USS DI-LOK Concrete reinforcing bars for pavements, bridge floor slabs, footings and abutments are supplied bent to specification. Highways are built faster and more economically with USS pre-engineered products.

USS, DI-LOK, TIGER BRAND, AMERICAN, COR-TEN, TRI-TEN, MAN-TEN and "T-1" are registered trademarks.

USS United States Steel

Steel bars reinforce pavement for maximum load-carrying capacity and long life. Steel lighting standards and other highway accessories are made from steel. They look attractive with a minimum amount of maintenance and last a long time.

Send for U. S. Steel's *free* 54-page booklet, "Keep Our Roads on the Go." It tells how the complete range of highway products and services available from U. S. Steel cut costs and speed operations in every phase of highway construction.



This mark tells you a product is made of modern, dependable Steel.

USS United States Steel

TRADEMARK

The highway market also is served by the following divisions of United States Steel: American Bridge Division, Pittsburgh, Pa. • American Steel & Wire Division, Cleveland, Ohio • Columbia-Geneva Steel Division, San Francisco, Calif. • Consolidated Western Steel Division, Los Angeles, Calif. • National Tube Division, Pittsburgh, Pa. • Tennessee Coal & Iron Division, Fairfield, Alabama • Universal Atlas Cement Division, New York • United States Steel Supply Division, Steel Service Centers, Chicago, Illinois.

United States Steel
Room 6281, 525 William Penn Place
Pittsburgh 30, Pennsylvania

Please send me your booklet, "Keep Our Roads on the Go."

Name _____

Company _____ Title _____

Address _____ City _____ Zone ____ State _____

ROADS AND STREETS

Sixty-Nine years of Editorial Leadership

Washington News Letter

By Duane L. Cronk, Director, Highway Information Services

April 10, 1961

President Kennedy's proposals for putting the big roadbuilding program back onto schedule ran into a cold front here last month in the House Ways and Means Committee. Unlike the vague praise for the highway program which the industry has become used to hearing out of the White House, the new President's statement was penetrating, thorough and thoughtful.

The Administration did not merely deplore the financial threat to continuation of the program and then dump the burden for reaching hard decisions on taxing in the lap of Congress. It took the strongest possible stand against stretching out or cutting back the program. And it recommended revenue measures which it knew would raise the ire of the AAA, and the powerful trucking lobby that very effectively killed the Grand Plan in 1955.

President Kennedy called for 1) extension of the temporary 4th cent federal gasoline tax, 2) a boost in the diesel fuel tax - from 4¢ to 7¢ per gallon, and 3) additional taxes on heavy trucks, tires, and tread rubber. Such revenues, he said, will bring in the additional $10 billion needed over the life of the undertaking.

* * *

Many here had hoped that the Bureau of Public Roads' four-year "210 Study" would turn up strong tangible proof that the general public benefits enough from highway improvements - enough such evidence to suggest substantial financial support of the program from the general fund. After all, before the Trust Fund was established billions of dollars for highways came out of the general fund. Kennedy tried to squelch any hopes for this kind of relief. On the basis of cost and benefits, he declared, motorists are realizing very substantial benefits from the new roads, and heavy trucks are not yet paying their fair share of construction costs.

For example, he said, a five-axle combination with full trailer is responsible for twelve times as much cost of building strength into a highway, as an automobile. And its share of benefits is "many times as much" as the average automobile driver's.

Testifying before the Ways and Means Committee on such matters last month, new Federal Highway Administrator Rex Whitton announced that the BPR has officially taken a position (for the first time) on one of the several controversial methods of determining costs and benefits of highway development. The so-called incremental method, he reported, is "the most sound" of the theoretical formulas. Furthermore, he predicted that the final results of the AASHO Test Road will bear him out.

(continued on next page)

If the Committeemen were not already cool to the Administration recommendations, however, the host of highway user, petroleum, and other interests which flooded the hearings last month would certainly have made them wary. The American Trucking Associations testified that an increase in taxes would "put many truck operators out of business. . .better the program should be stretched out." The American Petroleum Institute, other oil interests, the National Grange and the American Automobile Association argued for repeal of the 4th-cent federal gasoline tax.

Rubber interests appealed against the Administration proposed tax on inner tubes and tires. And the automobile manufacturers, sensing a concerted push by all groups for freezing the automotive excise tax and dedicating it to the Trust Fund, hastened to promote the user taxes instead.

* * *

The roadbuilding industry came out four-square for Kennedy's plan. "This is just what the doctor ordered," General Louis Prentiss, executive vice president of the American Road Builders Association said. "(It) meets the test of equity, distributing the costs of the program among the highway users who are the direct beneficiaries.' And M. Clare Miller, highway contractor and new president of the Associated General Contractors of America, declared that the AGC can "support completely" the President's recommendations.

General Prentiss has appealed to the ARBA membership to "get solidly behind" the pending legislation and work for general public understanding. It comes as close to being bi-partisan as possible, he said. "We can expect strong opposition to several of the financing propositions, but I believe that the people want these roads and are willing to pay for them if given a chance," he told the highway industry. "Let's give them a chance."

Encouraging support for the Administration was voiced by the Governors' Conference. Governor Steve McNichols of Colorado announced that the states strongly endorse the President's concepts and will go along with either the truck taxes or an alternate boost in the federal gasoline tax to 4½¢. He defended the conduct of the program and talked back to Congressional suggestions that the 90-10 Interstate matching formula be modified to 70-30. Other organizations, representing local government - the American Municipal Association and the National Association of County Officials - also praised the Administration highway financing scheme.

* * *

Thus almost everyone is officially on record now - for or against HR 5200 - and just about as might have been predicted.

Observers do not anticipate a speedy resolution of the controversy. Industries adversely affected by the proposed taxes have very ably earned a new consideration, at least, of their protests, and may be expected to continue to lobby aggressively and effectively for their interests. The Administration is probably already prepared to compromise, as most political entities are, regardless of the theoretical merits of its proposed fiscal policy. The danger, observers feel, is that in the absence of very firm public support for the Kennedy program, the President may decide that he is much too far out front. He may go for a cut-back of the big roadbuilding effort, rather than fight for adequate new financing as an easy out.

In spite of declarations to the contrary, this compromise stand is seen to be a very real possibility. A lack of public sentiment for the acceleration of the National Highway Program could, within the next few weeks, turn it into a probability.

NEVER BEFORE SIX-WHEELERS WITH HIGH-POWER, EXTENDED-LIFE V-6 OR TWIN-SIX GAS ENGINES!!!

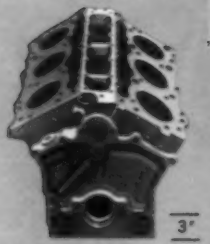
GMC
GENERAL MOTORS CORPORATION
TRUCKS

THE TRUCK TRIUMPH OF THE 60's

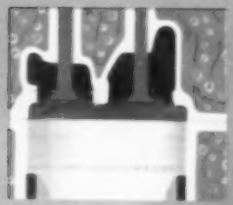
FROM ½-TON TO 60-TON . . . GENERAL MOTORS LEADS THE WAY!

OPEN HERE

GMC Truck & Coach • a General Motors Division • Pontiac, Michigan



BLOCK DEFLECTION VIRTUALLY ELIMINATED with short, stiff design, 3-inch drop skirt, generous inner ribbing and staggered cylinders . . . everything for more strength and rigidity.



INCREASED VALVE AND ENGINE LIFE. Temperature varies less than 4 degrees throughout entire engine. Up to 176 gallons of coolant circulating every minute does away with damaging "hot spots".

EXCLUSIVE GMC V-6 POWER!

Here is the proved six-cylinder principle in a more compact, stronger and easier-to-service engine. Top hauling power over a broad, low rpm range makes rugged, heavy, off-highway construction work easy and permits top-speed highway hauling . . . saves damaging, costly wear and adds to fuel economy. Fully-machined combustion chambers assure precise combustion balance. Cam lobes dip in oil to prevent scuffing, scoring and galling. Short, separate intake inlets provide equal fuel-air mixture for smoother, maximum power from every drop of fuel. Spark plugs are located inside the 60 degree "V" for longer life. Extra-big sodium-filled valves with positive rotators are the best available. Servicing is more convenient with plenty of space around engine. See your GMC Dealer for all the life-extending, profit-producing advantages.

Complete one-stop parts and service is available at every one of nearly 3000 GMC Dealers. For the one nearest you, see the Yellow Pages.

GMC TRUCK Guardian Maintenance

Haul bigger loads, dependably, with light-weight tandems. Equally loaded axles and true alignment increase tire and axle life. Rubber mounts and bushings greatly reduce maintenance. Inter-axle differential lock is standard. Frame and reinforcement combinations assure capacity loads on most severe on and off-road operations.

CONVENTIONAL IN NAME

PRICE These new 105" BBC Conventional Ser
lowest-priced six-wheelers built by GMC . . . surp
buying cost, surprisingly low owning cost.

PERFORMANCE Exclusive 401 V-6 truck-built eng
most torque of any comparable engine . . . and ove
lower, life-extending rpm range, too.

Your GMC Dealer listed in the Yellow Pages is

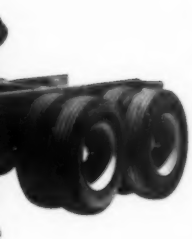
IE ONLY!

Series are the surprisingly low

engine has the over a broader,

DEPENDABILITY V-6 engines can't be beat. Cabs with double-walls and solid-armor structure can take the most rugged construction usage day after day, year after year. Every truck must pass over 1000 rigid, detailed inspections. And every one is tested on the road for superior construction before it is released from the factory.

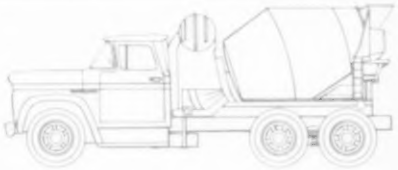
CONVENIENCE It's an easy, convenient step in and out with low cab floor height . . . less awkward, less tiring for the driver. Hood is extra-wide and full-opening to make inspection and maintenance easier and quicker.

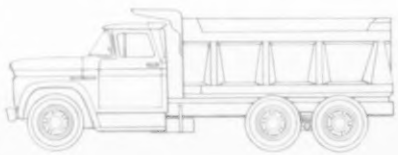


QUICK FACTS—CONVENTIONAL SIX-WHEELERS

SERIES	W5000	W5500
GVW	35,000-**37,000** lbs.	43,000-**48,000** lbs.
GCW	50,000 lbs.	60,000 lbs.
AXLES—FRONT	7,000-**9,000** lbs.	9,000-**15,000** lbs.
REAR	28,000 lbs.	34,000 lbs.
BRAKES—HYDRAULIC	953 sq. in.	—
FULL AIR	**943 sq. in.**	1100 sq. in.
ENGINE—V-6 GAS	351 cu. in. 180 hp.	401 cu. in. 210 hp.
	401 cu. in. 210 hp.	—
TRANSMISSION	5-speed direct	5-speed direct
	3-speed aux.	**4-speed aux.**

Equipment in bold type is optional





Here are just two of many popular uses of GMC Conventional six-wheelers.

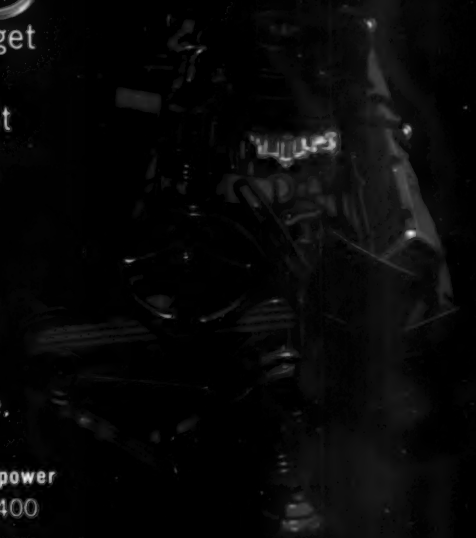
PULL

es is waiting to prove why GMC six-wheelers are your best construction hauling buy. Contact him today.

UNDISPUTED HAULING S

Greatest load-moving power of any standard equipment gas engine . . . that's GMC's exclusive Twin-Six! You get highest usable torque and horsepower over a longer, lower rpm range . . . great reserve power to haul loads at part throttle under normal conditions, using reserve only for hills. Results: amazing fuel economy, gear shifting reduced up to 60%, higher sustained road speeds and greatly increased engine life.

Displacement	Max. Torque Range	Max. Horsepower
702 cu. in.	625-630 @ 1400-2100	275 @ 2400



SUPERIORITY

Short 90″ BBC dimension and 28″ front axle location provides better weight distribution for bigger loads; less over-all length and shorter turning circles, too.

CHOICE OF TANDEMS

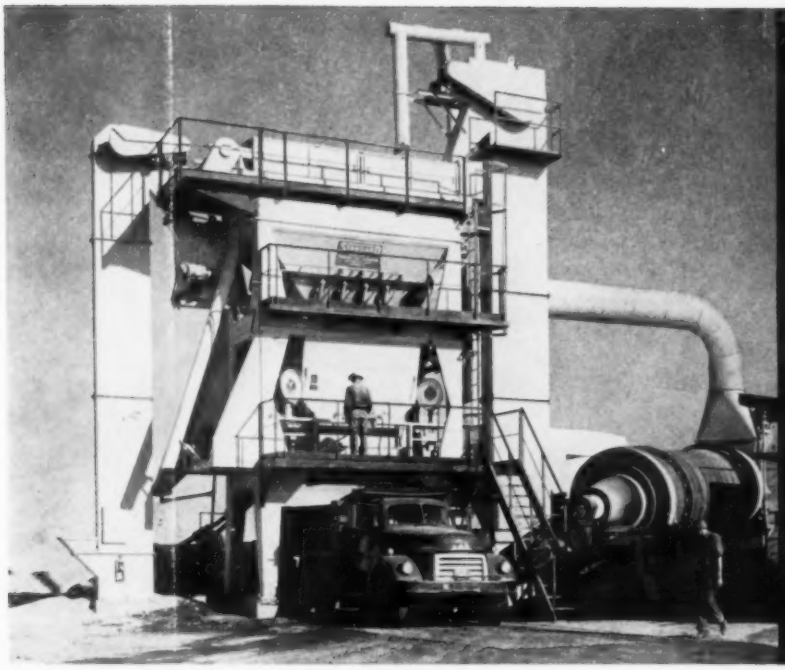
Get the tandem axle ratio and capacity to match your haul with choice of 34,000-lb. single or double reduction to 50,000-lb. double reduction axles.

You can get high tensile steel or heat treated full-depth frames with reinforcements for every load or use . . . dependable, lasting load-carrying ability.

Improved truck control, more load and road stability are the result of GMC's wider tread, wider spring centers and new steering setup. Capacity—11,000 lbs. standard and 15,000 lbs. with power steering optional.

Diesel-powered 90″ BBC GMCs are popular construction trucks. And justifiably so with the V-6 diesel that produces more power per dollar, per pound, per cubic inch displacement... plus many more money- and hour-saving advantages. Your GMC Dealer is the man to see for complete data.

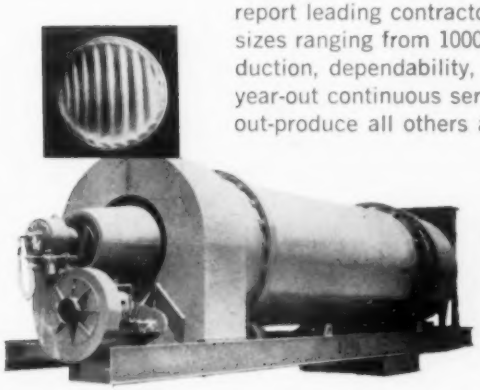
Get the most "Go" ever packed into a big-load 90" BBC! With the exclusive Twin-Six under the hood, working ability cannot be surpassed. Top loads and profits are yours, too, with ratings from 45,000 lbs. GVW to 120,000 lbs. GCW.



*STANDARD

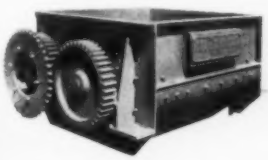
ASPHALT PLANTS OUT-PRODUCE ALL OTHER ASPHALT PLANTS *size for size!*

*"STANDARD Asphalt Plants out-produce all other Asphalt Plants, size for size" . . . report leading contractors the world over. Standard Asphalt Plants — manufactured in sizes ranging from 1000 pound to 8000 pound capacity — are known for their high production, dependability, ease of operation, all around operating economy, and year-in, year-out continuous service. Some of the "BIG" reasons why Standard Asphalt Plants out-produce all others are shown below.



SUPER-LIFT DRYER

Standard's exclusive saw-tooth lifters provide maximum capacity, because more aggregate is exposed longer to the heated air. Entire dryer is self-contained unit with individual electric gearmotors (or, diesel engine power). It features positive ring gear and pinion drive, leak-proof dust seals, free floating tires, and oversized trunnions mounted in self-aligning roller bearings.



HI-SPEED MIXER

Provides better and faster mixing action because more agitation is imparted to the mix within any given period of time. The Standard hi-speed mixer is ruggedly built of heavy welded steel, one piece construction and is fitted with patented cast alloy liners, stuffing boxes at mixer ends, heavy duty roller bearings, and many other operational cost saving features.

DUST COLLECTOR

The Standard twin dust collecting system provides a carefully engineered and balanced induced air system. This system, in conjunction with the generously sized dryer burner furnishes maximum firing capability and efficiency on the dryer. This packaged dust collector can be utilized either as a stationary or portable unit.

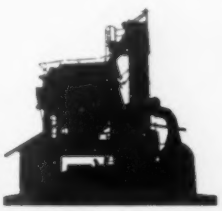
Before you buy . . . talk to the man who owns a Standard

STANDARD ASPHALT PLANTS

STANDARD / Complete line of Asphalt Plants 2000 through 8000 pound capacity.

Model T-M • Trailer-mounted, self-contained.

Model R-M • Semi-portable and stationary



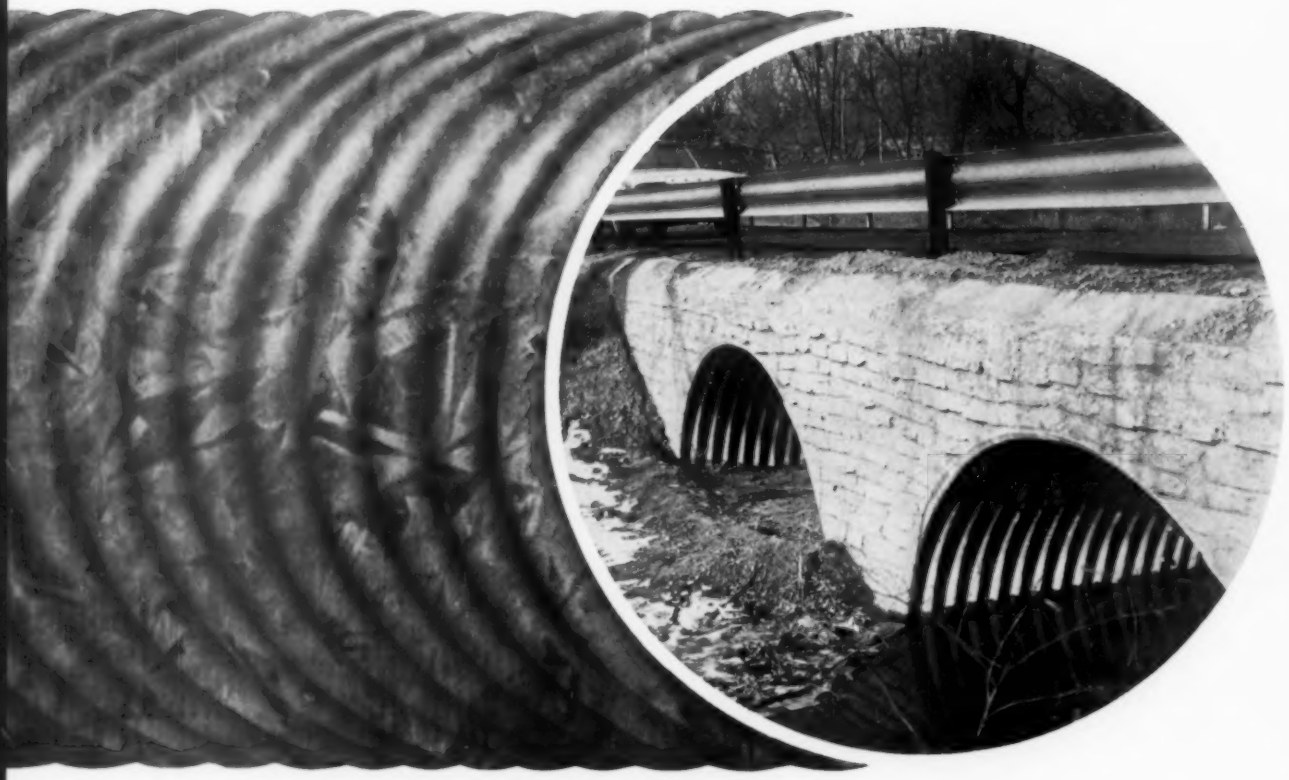
Model S-E • Self-erecting, fully portable.

STANDARD STEEL CORPORATION Manufacturers of: Asphalt Plants • Rotary Dryers • Kilns • Coolers • Cryogenics

GEN. OFFICES AND PLANT: 5003 Boyle Ave., Los Angeles 58, Calif. • MIDWEST OFFICES AND PLANT: Decatur 03, Ill. • EASTERN OFFICES AND PLANT: Lowell 03, Mass.

. . . for more details circle 347 on enclosed return postal card

Guardrails and culverts live longer . . .



GUARDED BY GALVANIZED STEEL

Wherever traffic or drainage flows, you'll find modern galvanized steel at work. In guardrails, for example, where nothing quite matches galvanized steel: the strength of the steel for impact; the coating of zinc for durability and ease of maintenance; the economy of the combination. And in culvert pipes, where the exceptionally high strength-weight ratio of this zinc-coated metal brings cost per year down to the barest minimum.

WEIRKOTE® IN PARTICULAR—You gain when you specify long-life galvanized steel for guardrail and culvert installations. And you gain even more when you specify National Steel's Weirkote. To the inherent strength of steel, Weirkote adds *enduring* zinc protection. Weirkote is manufactured by two National Steel divisions, Weirton Steel and Midwest Steel. For further details, write Weirton Steel Co., Weirton, West Virginia.

MIDWEST STEEL
Portage, Indiana

WEIRTON STEEL
Weirton, West Virginia

Divisions of
NATIONAL STEEL CORPORATION

. . . for more details circle 354 on enclosed return postal card

Charles T. Murray Passes

Managing Editor of Gillette Publications

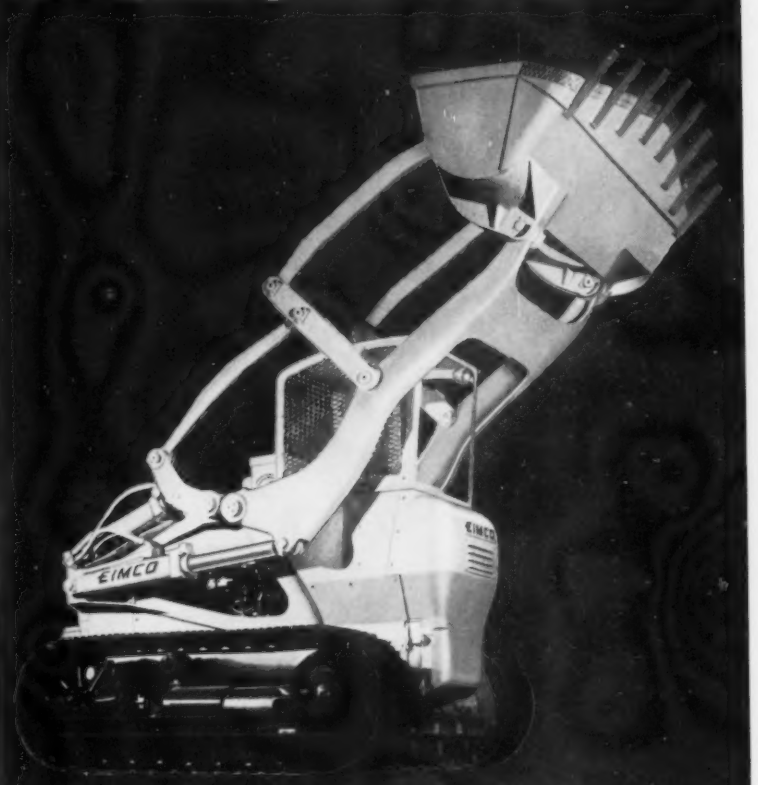
Older readers of Roads and Streets will best remember Charles T. Murray, long-time Managing Editor of Roads and Streets and other Gillette publications. He died February 8 at age 83 after only a few months of complete retirement. He had worked part-time for the past three years.

Charles Murray joined Gillette Publishing Company in 1906, the year it was founded, then beginning an editorial career that was remarkable for its length, its voluminous accomplishment, and the technical evolution he was able to help follow and interpret in his lifetime. During his 52 years of daily desk and field work he saw road building emerge from water-bound macadam and steam roller days to the multi-billion-dollar, highly-mechanized art and science that it represents today.

Following his graduation from the University of Vermont, Charles Murray worked on railroad construction in Canada and Cuba, then for a while was an editor on the old Engineering News, which later became part of Engineering News-Record. On joining H. P. Gillette and Mr. Clark in 1906, when Clark Publishing Co. predecessor to Gillette Publishing Company was founded, he took part from the first in a venture which made pioneering history in book and magazine publishing in the fields of road-building and engineering construction. Engineering-Contracting and the Roadmaster and Foreman was the first publication. It became Engineering and Contracting, for many years a leading journal. Following numerous mergers with other magazines, this journal was split during the 1920s into several publications: Water Works, Railways, Buildings - and Roads and Streets, which today survives as a broad industry magazine.

Charles Murray was the managing editor of this succession of publications. His work through the years was marked by great energy, imagination and use of constantly sharpened tools of his craft.

The Quality-Built Eimco 123



Here is the finest, most productive Front End Loader in its class . . . the Eimco 123. It has a heritage of experience and success in rock loading that only Eimco, the world's largest producer of underground rock loading equipment, can offer. It will outproduce, outload, outmaneuver and outlast any other loader of its size and power. Strong claims? Sure, but we have strong facts to back them up. Check them at your Eimco Dealer or Branch, or write The EIMCO Corporation, P.O. Box 300, Salt Lake City 10, Utah, U.S.A. for Bulletin L-1097.

THE EIMCO CORPORATION
Home Office: Salt Lake City 10, Utah, U. S. A.
TRACTOR LOADER DIVISION

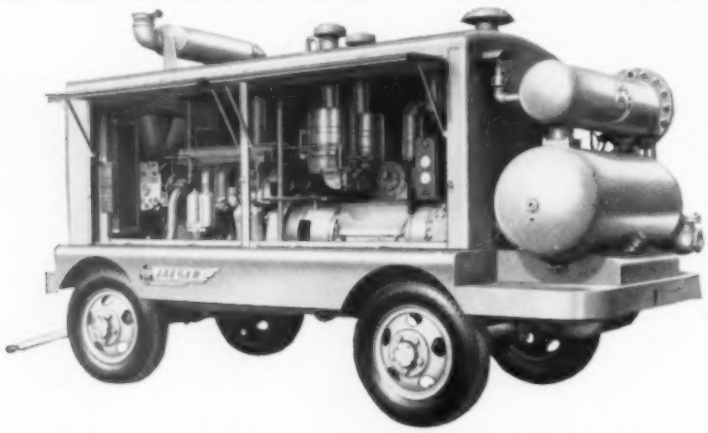
EXPORT OFFICE:
52 South Street, New York, N. Y.

B-721

. . . for more details circle 300 on enclosed return postal card

Seen at AED in Los Angeles

In Gillette Publishing Company's Hospitality Room during the AED convention at Los Angeles. "Miss Nevada" (Jean Moorhead) reached for the Lucky Winner. The prize consisted of accommodations for two, for two nights at the Hotel Sahara in Las Vegas. Shown holding the Lucky Winner is Howard Worthington, of the Charles Machine Works, Inc. The winner, Mr. Norval Grubb, Manager, Construction Equipment Division of ESCO Corporation, Portland, Oregon. A total of 619 stubs were deposited in the "box". (Photo courtesy of Lynn McKinney of Heco Division, Hardwicke-Etter Company, Sherman, Texas).



JAEGER "900" is the efficient rotary

Delivers in excess of 900 cfm at a fuel-saving, engine-saving 1700 rpm, using the same GM 6-110 diesel which others operate at 1800. See your Jaeger distributor, or send for Catalog.

THE JAEGER MACHINE CO., 223 Dublin Ave., Columbus 16, Ohio

. . . for more details circle 328 on enclosed return postal card

AGC Booklet Supports Single-Contract Method

Contract awarding authorities from private industry and from all levels of government are quoted as supporting the single-contract method of construction, in a new brochure published by the Associated General Contractors of America, Washington, D. C.

Titled "Save Construction Dollars with America's Basic Construction Method, The Single Contract System", the brochure states that about 95 per-cent of federal contracts and 85 per-cent of the states use the single-contract method, as well as the overwhelming majority of local government and private contract awarding authorities.

"America's Basic Construction Method" is cited as a time and money saver through efficient coordination of the complex details in a modern construction job by the general contractor. Owners save money, and responsible and capable subcontractors gain under the system, because without the general contractor providing the necessary coordination, there may be costly slowdowns.

The booklet has been sent to engineers, architects, private companies, and members of Congress and governmental agencies. Individual copies are available free from the Associated General Contractors, 1957 E. Street, N. W., Washington 6, D. C.

Microwave System Radio For Northern Idaho

A 142-mile microwave system spanning a mountainous region of Northwestern Idaho is being installed by the Radio Corporation of America as part of a planned statewide network to serve all agencies requiring point-to-point communications.

The relay segment will include circuits for civil defense, law enforcement, state highway maintenance and forestry. Much of the area to be served is heavily timbered mountains. A problem has been the location of relay tower sites which would be reasonably accessible for service.

The network will employ six tower relay and terminal stations with transmission signals beamed to Lewiston by a reflector unit.

A Mud Problem?

USE

KOMPACTOR

THE CHEMICAL AID TO SOIL CONTROL

After KOMPACTOR treatment most dirt roads will be passable in wettest weather. Applied with standard sprinkling equipment, KOMPACTOR, when used as directed, cures most mud problems effectively and for years to come!

KOMPACTOR is not a soil cement; instead it removes from the soil many of the unfavorable properties that reduce the coefficient of friction of the soil — the real reason for most impassable roads.

For detailed descriptive brochure, write or phone . . . . . .

ANOTHER REYNOLDS FORMULA

THE CENTRAL-REYNOLDS COMPANY

KOMPACTOR DIVISION

P. O. BOX 1203 FRESNO, CALIFORNIA PHONE ADAMS 7-1249

. . . for more details circle 293 on enclosed return postal card

SPEEDPULL® is your best profit insurance on long-haul earthmoving because it . . .

Here's what's DIFFERENT and BETTER about the Speedpull prime-mover

HYDRAIR* SUSPENSION on front wheels eliminates need for axles, springs and their related maintenance costs.

POWER-TRANSFER DIFFERENTIAL keeps production high on soft, slippery terrain, on slopes, curves.

276 HP and short-coupled drive-train deliver ample power for fast loading, quick acceleration, speedy hauling.

37.7 MPH speed cuts cycle times to minimum. Smooth ride encourages operators to *use* higher speeds.

DROP-OUT TRANSMISSION and other low-cost maintenance features help reduce downtime for bigger profits.

BIGGEST BRAKES in the industry plus new Spot-Turn brakes assure complete safety, longer unit life.

You'll find that the Speedpull gives you the best power-to-weight ratio in its class, the shortest turn-radius, highest front clearance, and many other "best-of-class" advantages. They spell out *p-r-o-f-i-t-a-b-i-l-i-t-y*.

Fullpak scraper is lower, wider than most scrapers. Bowl floor rises only 1° from horizontal, so dirt doesn't have to be "lifted" in. Engine power is used to cut and move dirt, rather than lift it. Curved tailgate and apron keep dirt rolling for lively "boil" that holds voids to minimum, assures maximum pay-yards every cycle.

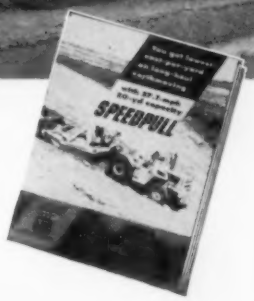
sets speed records with single Fullpak® scraper ...production records with tandem Fullpaks

Move two loads every trip with tandem operation. After basic installation of hitch and plug-in jacks, you can add or take off second scraper in less than ½ hour. You double capacity at the cost of a second scraper only. Scrapers load one at a time, so you can use same-size pusher you've been using. You save on salaries and on fuel, too.

Get the full facts: by mail or in person

You can now get the complete Speedpull story in this new 16-page bulletin. Your LeTourneau-Westinghouse Distributor has copies, or you can write direct to the factory at Peoria, Illinois. Best bet: call your LW Distributor for full details on this long-haul profit-builder.

*Trademark CSP-2297-DC-2



LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

. . . for more details circle 336 on enclosed return postal card

For Year-Around Efficiency Graders Do DOUBLE-DUTY with

FRINK SNO-PLOWS
REG. U. S. PAT. OFF.

Now, **another** cost-saving FRINK Sno-Plow combination! Uniting earth-moving with snow-removing, a grader equipped with a FRINK Sno-Plow gives year-around utility. A simple installation readies many graders for efficient winter snow-fighting.

The heavy-duty V-Type Sno-Plow with eight- or nine-foot cutting edge is attached in the same way as on trucks, with complete full-power hydraulic control. The driver has at his fingertips the standard FRINK quality of rugged, dependable operation.

For full details on making year-around cost-saving use of your graders with extra-duty FRINK Sno-Plows, write: Dept. RS-461

- V-Type
- Roll-Over
- One-Way
- Reversible Trip
- Leveling Wings

FRINK SNO-PLOWS
REG. U. S. PAT. OFF.

FRINK Sno-Plows, Inc.
Clayton, 1000 Islands, N. Y.

Eastern Steel Products, Co.
Preston, Ontario, Canada

. . . for more details circle 306 on enclosed return postal card

People

Tuthill Heads ACI

Lewis H. Tuthill, Sacramento, California, is the new president of the 10,300-member American Concrete Institute. His election was announced at ACI's 57th annual convention, held in St. Louis February 20-23. Mr. Tuthill is a concrete engineer with the Division of Design and Construction, California State Department of Water Resources. He succeeds Prof. Joe W. Kelly, University of California.

Roger H. Corbetta, head of Corbetta Construction Co., New York City, was elected ACI vice-president; and Raymond C. Reese of R. C. Reese & Associates, engineers, Toledo, Ohio, continues as a 2-year vice-president. Installed as board members were Arthur R. Anderson, G. E. Burnett, Chester P. Seiss, and Anton Tedesko.

Continuing on the ACI Board of Direction are A. Allan Bates, Portland Cement Association, Skokie, Ill.; George C. Ernst, Dunmire and Ernst, Lincoln, Nebr.; E. A. Finney, Michigan State Highway Dept., E. Lansing, Mich.; Bruce E. Foster, National Bureau of Standards, Washington, D.C.; Ben C. Gerwick, Inc., San Francisco; James A. McCarthy, University of Notre Dame, South Bend, Ind.; and Walter J. McCoy, Lehigh Portland Cement Co., Coplay, Pa.

J. Rogers Martin Heads Oklahoma Training

J. Rogers Martin, for nine years Engineer-Manager of the Asphaltic Concrete Association of Oklahoma, has been chosen by the Oklahoma state highway department to head a staff training program. The purpose is to upgrade efficiency of the department's maintenance and construction employes and improve inspection. Martin who holds both chemical and civil engineering degrees is widely known in materials work. He was for 13 years with the Texas highway department, primarily in the materials phase and chief of the department's laboratory four years.

Sawyers, Johnkoski "In Again" in W. Virginia

Burl A. Sawyers, new road commissioner in West Virginia has picked Vincent J. Johnkoski for the "No. 2 spot" in the state road department, with title not yet determined. Johnkoski has formerly served the department along with Sawyers under the state's "in and out" political system, recently being with the Charleston office of Michael Baker, Jr., Inc., consulting engineers.

IT WAS ANNOUNCED that a recently retired veteran of more than 20 years with the Navy's Civil Engineering Corps, Joseph A. McHenry, was

Continued on page 38

What size grader do you need?

There's an LW that fits your requirements

Once your grader needs are more or less established, you have an opportunity to specialize on a grader of a particular size. It's possible, in a multi-model line, to get the exact size that's just *big* enough to handle your work . . . just *small* enough to afford good savings in operating costs. Then you're sure of lowest investment for your work assignments.

LeTourneau-Westinghouse graders are available in 7 sizes, with horsepower ratings from 85 to 190, weights from 10¾ to 14 tons. All sizes have constant-mesh transmission; 145 and 190-hp POWER-*Flow*® models have torque converter. A variety of matched attachments increase the work range in each size. Major items are: scarifier, bulldozer blade, push-plate, Ateco rear-mounted ripper, snow removal equipment, Jebco Elegrader and Preco Dial-A-Slope blade control.

Let your LW Distributor help determine what size of graders will do *your* work most efficiently, cut operating costs, and give you highest return on your grader-investment dollar.

85-hp 330 . . . this economy-priced model has many LW "big-grader" features. Another low-budget LW grader is the 100-hp 330-H.

115-hp 440 . . . biggest-value motor grader in this popular size. 8-ft long, 35-in. high dozer-blade is hydraulically controlled from the cab.

125-hp 550 . . . heavy-duty all-purpose machine. Choice of GM or Cummins diesel engine, as on all LW graders.

160-hp 660 . . . biggest, heaviest grader in the "straight-shift" Le Tourneau-Westinghouse line.

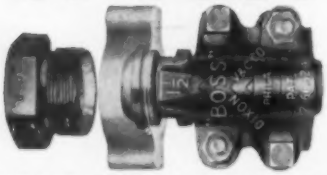
145-hp 550 POWER-*Flow* . . . torque converter, infinite speed ranges to 26.4 mph. "550" shown is equipped with Dial-A-Slope blade control. Push-plate and V-type scarifier give it extra job versatility. 660 POWER-*Flow* has 190 hp . . . speeds to 26 mph. G-2395-G-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company Where quality is a habit

. . . for more details circle 335 on enclosed return postal card

"GJ-BOSS"



GROUND-JOINT FEMALE COUPLING, STYLE X-34

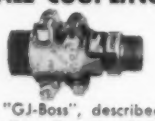
SO *Reliable*
FOR PILE DRIVING

...AND ANY STEAM, AIR, WATER AND HYDRAULIC SERVICES... HIGH OR LOW PRESSURE

Washerless

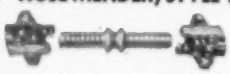
Unequalled for safety, efficiency and long service life. Ground-joint union between stem and spud provides leak-proof, trouble-free seal . . . no lost or worn-out washers to replace. All parts malleable iron or steel, rustproofed. Furnished with superstrong "Boss" Offset and Interlocking Clamps. Sizes ¼" to 6", inclusive.

COMPANION MALE COUPLING "BOSS" STYLE MX-16



Companion coupling for "GJ-Boss", described above, and "Boss" Washer Type Couplings Style W-16. Each size fits same size hose . . . oversize hose not required. Furnished with "Boss" Offset and Interlocking Clamp. Sizes ¼" to 6", inclusive.

"BOSS" HOSE MENDER, STYLE BM-16



The practical, safe way to restore damaged hose to service. Fitting consists of corrugated mender tube and two "Boss" Interlocking Clamps. Tube has flanges to engage clamp fingers. Thoroughly rustproofed. Sizes ½" to 6"

Stocked by Manufacturers and Distributors of Industrial Rubber Products

DIXON
Valve & Coupling Co.
GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
BRANCHES—CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON
DIXON VALVE & COUPLING CO., LTD., TORONTO, Associate Companies:
Buck Iron Company, Inc., Quarryville, Pa. · Precision Drawn Steel Company, Camden, N.J.

. . . for more details circle 299 on enclosed return postal card

People

Continued from page 36

Capt. Joseph A. McHenry

appointed an assistant vice-president of J. H. Pomeroy & Co., Inc., general contracting and engineering firm of San Francisco.

Awarded both the Bronze and Gold Star medals for supervision of construction of fleet facilities in the Pacific Area during World War II, Captain McHenry also served as executive officer of the Public Works Department at the U.S. Naval Academy. Later, he served as deputy chief of Yards and Docks.

WILLIAM C. M. BUTLER, JR., of Hazleton, Pa., is president of Associated Pennsylvania Constructors. He is the son of a former APC president, W. C. M. Butler, now on the advisory board. Butler is president of Central Pennsylvania Quarry, Stripping and Construction Co., and president or director of several other companies.

Herbert R. Imbt, of State College is Association vice president, A. E. O'Brien has been elected to his 27th term as executive secretary at Harrisburg.

William C. M. Butler

LOGAN DICKERSON, president of W. P. Dickerson & Son, Youngwood, Pa., heads the Constructors Association of Western Pennsylvania for 1961. A graduate civil engineer as well as construction leader, he is a founder and past president of the Prestressed Concrete Association of Pennsylvania.

Association vice-presidents are Joseph B. Fay, of Joseph B. Fay Co., Pittsburgh (highway division), and Orval Auhl, Dravo Corporation, Pittsburgh (heavy).

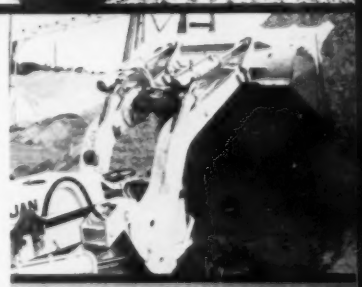
Logan Dickerson

FRANK LYONS, recently with the Missouri state highway department, has been appointed Highway Director in Oklahoma. He succeeds Gen. Lee B. Washbourne, who has accepted a consulting engineer position with Oklahoma City's multi-million-dollar water project.

HARRY B. BEARD, JR., has been advanced to Project Engineer with the consulting firm, Whitman, Requardt and Associates, Baltimore. Mr. Beard's background includes design work with the Maryland State Roads Commission and the Corps of Engineers.

TROJAN SAFETY CURVE LIFT ARMS

BUILT AS ARMS SHOULD BE...



Only Trojan's box-type construction gives greater strength & capacity.

Many times stronger than single plate construction, Trojan's box-type design produces higher resistance to torsional loads and, with the tubular cross member, minimizes normal working stresses — results in more even load distribution. All fittings and couplings are exposed and easily accessible for faster maintenance. The safety curve box design with internal linkage assures greater operator protection — yet allows full visibility for fast, continuous production . . . Let the many advantages of Trojan's high performance design cut your operating and maintenance costs. Ask your local distributor for a feature by feature inspection.

TROJAN
TRACTOR SHOVELS
YALE & TOWNE

THE YALE & TOWNE MANUFACTURING COMPANY
TROJAN DIVISION
BATAVIA · NEW YORK

SEVEN MODELS TO CHOOSE FROM, 7,000 LBS. TO 24,000 LBS. CAPACITY

. . . for more details circle 356 on enclosed return postal card

BIG POWER BIG CAPACITY

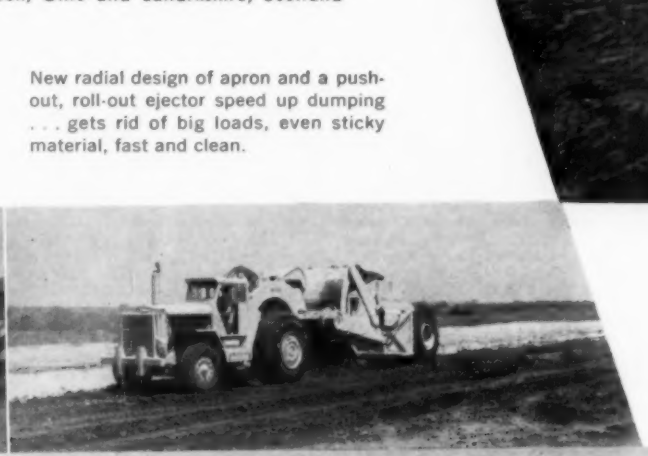
new SS-40

For moving loads up to 125,000 pounds on long, high-speed scraper hauls, the new Model SS-40 has already proved it's away ahead of any other big scraper in productive capacity. Powered by a 12 cylinder GM diesel of 432 h.p. with 4-speed Torqmatic Drive, this "Euc" moves big payloads at speeds up to 34 m.p.h. Stability and good weight distribution of the six-wheel SS-40 permit faster safe travel speeds that save time on every cycle. With its new push-out, roll-out ejector this "Euc" is the first super scraper able to dump big loads in a hurry.

Teamed with the TC-12 "Twin" Crawler for push loading, the SS-40 gets a heaped load in its low, wide bowl and is on the haul road fast. This big power, big capacity "Euc" equipment is your best bet for high production and low yardage costs on dams, highway work, other heavy construction and stripping operations. Ask your dealer for specifications and technical data on the SS-40 Scraper and TC-12 Crawler.

EUCLID **Division of General Motors, Hudson, Ohio**
Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

Maneuverability and 425 net h.p. make the TC-12 with full-power shift tops for pusher work, heavy dozing and ripping tough material.



New radial design of apron and a push-out, roll-out ejector speed up dumping . . . gets rid of big loads, even sticky material, fast and clean.

. . . for more details circle 356 on enclosed return postal card

BIG PRODUCTION

52 YARDS HEAPED ▲ 34 M.P.H. LOADED ▲ 432 H.P. V-12 ▲ PUSH-OUT, ROLL-OUT EJECTOR

GM GENERAL MOTORS EUCLID

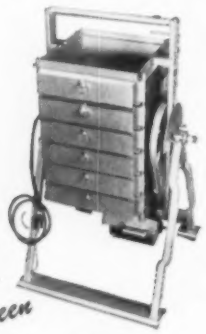
EUCLID

FOR MOVING EARTH, ROCK, COAL AND ORE

GILSON TEST-SIZING EQUIPMENT

GILSON TESTING SCREEN

Handles up to 1 cu.ft. of concrete aggregates, coal, or minerals; 2 to 7 simultaneous separations in about 3 min.; 4" to 200-mesh.



GILSON Porta-Screen

For field inspection, ready-mix, blacktop, concrete products, minerals; portable, operates free-standing; samples up to 25 lbs.; 1½" to 200-mesh.

GILSON SAMPLE SPLITTER

Halves or quarters large samples in seconds; handles any material from sand to 4" aggregates; adjustable openings ½" to 6".

WRITE FOR GILSON CATALOG SHEETS ON THESE AND OTHER GILSON EQUIPMENT AND ACCESSORIES

GILSON SCREEN CO.
MALINTA, OHIO

. . . for more details circle 313 on enclosed return postal card

New Publications

Treating Clay to Aid Winter Excavation

A technique for treating clayey soils to aid construction excavation in winter is described in a translation from a Russian civil engineering journal. This article is one of five English translations of Soviet technical literature released to science and industry through the U.S. Office of Technical Services.

The article describes a method of artificial salting which permits the erection in the winter of an embankment of clayey soils, prepared by using water soluble salts. The suggested method for computing the amount of salt needed for the initial preparation of the soils, allowing the method to be used under production conditions, is discussed in 60-21792 Using Salt in Treating Clayey Soils for Construction in The Winter Time. 1960. 17 pages. Translation of Stroitel'stvo i Arkhitektura (USSR), 1959. S. B. Ukhov. Address: Office of Technical Services, Business and Defense Services Administration, U.S. Department of Commerce, Washington 25, D.C. Price 50 cents.

Welding Data Sources

The American Welding Society has issued its 1960 Supplement to the AWS Bibliographies. The original list of articles in the Welding Journal (1937-57) is updated yearly by these supplements. The complete Bibliographies provide a record of all articles on welding, welding research and related subjects.

The Supplement has been designed for use as issued or as supplementary material to bring previously issued AWS Bibliographies up-to-date. The format is identical and entries under a given subject are contained on one or more pages.

Copies of the Bibliographies may be obtained at $1.50 from the American Welding Society, Technical Dept., 33 West 39th Street, New York 18, New York.

Beam Design Handbook

Design of Prestressed Concrete Beams. By William H. Connolly, 252 pages, 6 x 9; 120 tables, charts, diagrams. Price $11.50. F. W. Dodge Corporation, 119 West 40th Street, New York 18, N.Y.

A rational method for designing pretensioned and posttensioned concrete members, by the chief engineer of Goldberg & LeMessurier's Prestressing Division. Covers the most difficult and time-consuming aspect of prestressed concrete design: selecting the cross section; tables for selecting flange widths for I-beams and T-beams; worked solutions for various situations commonly encountered in practice; tabulated solution for I-beams beyond the critical span; analysis for differential shrinkage; a basic handbook for structural engineers, architects, civil engineers, professors of engineering and architecture.

CONCRETE ENGINEERING HANDBOOK. Editor-in-Chief, William S. La Londe, Jr., Chairman, Department of Civil Engineering, Newark College of Engineering, Newark, N.J.; Assistant Editor, Milo F. Janes, Consulting Structural Engineer, New York, N. Y. 1,216 pages, 6 x 9, 735 illus. McGraw-Hill Book Information Service, 327 West 41st St., New York 36, N. Y. $25.00.

A comprehensive and up-to-date reference on design methods and data, for all types of structures, written by 20 specialists. The book's wide range includes design methods for various types of structures, and a special resume on structural theory, torsion, materials, and construction methods, many diagrams and tables, and other design aids.

Sections are given to the design of pavements, bridges, buildings and their elements, bins for bulk storage of materials, and design of skin structures. Special topics include the handling of deflections in building frames due to earthquake force, and applications of prestressed concrete.

EFFECT OF WATER-REDUCING ADMIXTURES AND SET-RETARDING AD-

Continued on page 50

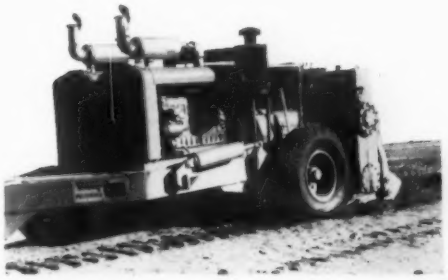
Crush all your sub-grade, sub-base or base materials with the new

PETTIBONE WOOD PULVERIZER

You get the advantages of lowest cost in-place crushing *plus* top production with the new Model 660 Pettibone Wood Pulverizer.

Working on an Interstate Highway job in the photo above, the Model 660 obtained a production rate of 600 tons per hour in crushing rock to 2½" minus. The material originally had 20% to 25% oversize. Even higher production has been reached crushing various materials to different sizes.

Learn how *you* can save taxpayers' money and increase production with the new Model 660 Pettibone Wood Pulverizer . . . write today for full details.



Pettibone Wood stabilization equipment is used for highway, airport and parking lot construction the world over. Write today for free job studies and your copy of "The A B C's of Soil-Cement Stabilization", an informative, 36 page booklet on stabilization techniques.

PETTIBONE
A SUBSIDIARY OF PETTIBONE MULLIKEN CORP
WOOD MFG. CO.

PETTIBONE WOOD MFG. CO.

P. O. BOX 620, NORTH HOLLYWOOD, CALIFORNIA

Originators of mix-in-place roadbuilding equipment

. . . for more details circle 343 on enclosed return postal card

PAYLOADER with exclusive 4-in-1 Bucket handles jobs that are

impossible

for any other rubber-tired tractor-shovel

"Our '4-in-1's' do the work of 3 to 5 machines. No contractor should be without them," says a Superintendent in explaining how a PAYLOADER with Drott "4-in-1" Bucket reduces equipment investment, and time and labor requirements on many contracts.

This unique Bucket, says one PAYLOADER operator, "is like a magic wand because it can do so many things." What's more, because of its rubber-tire mounting, it can work on or off the highway – can work on streets and walk over curbs and sidewalks without damaging them.

It's a Clamshell and as such is most spectacular – and profitable. The powerful hydraulic clam action grips stumps, boulders, concrete slabs and other irregular shapes quickly and firmly; can deposit them gently in a truck. With the clamshell action, you can fill the bucket without forward motion of the tractor – can clean-up close to obstructions and pick up small piles of dirt from the street cleanly. One contractor says, "We save 90% of clean-up costs with the '4-in-1' unit."

It's a Bulldozer with the clam portion raised. The rear half of the "4-in-1" Bucket is a true bulldozer with an engineered moldboard curvature for smooth earth-rolling action. Accuracy and ease of control is possible because of the exclusive radius control and instant, responsive forward-and-backward tilt for depth control.

It's a Scraper – a bottom-loading scraper for stripping with fractional accuracy. Like a carpenter's plane, the blade of the bulldozer portion does the cutting while the clam segment ahead acts as a depth gauge – and all

PAYLOADER with "4-in-1" Bucket is a Shovel, Bulldozer, Clamshell and Scraper.

hydraulically controlled from the operator's seat. You cut whatever depth you want and the material boils up into the bucket. Like a carry-all scraper, too, it can spread its loads to desired thicknesses.

It's a Shovel and can always be used like a regular tractor-shovel bucket by loading and dumping through the front. It can also dump through the bottom by clam-opening action. Clam-type dumping is an advantage when extra dumping height and reach is desired – also for better bucket-cleaning characteristics when handling sticky materials.

Drott "4-in-1" Buckets are available exclusively-on-rubber on PAYLOADER tractor-shovels, and for all five 4-wheel-drive Models – bucket capacities from 1 to 4 cu. yd. (S.A.E. Rated). Your nearby Hough Distributor is ready to give you complete data on PAYLOADER with "4-in-1," or other useful Allied Equipment.

THE FRANK G. HOUGH CO.
768 Sunnyside Ave., Libertyville, Ill.

☐ Send new booklet "PAYLOADER — Drott 4-in-1 Bucket"
☐ Send "PAYLOADER and Allied Equipment" literature.

Name _____
Title _____
Dept. _____
Street _____
City _____ State _____

4-B-1

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY – INTERNATIONAL HARVESTER COMPANY

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER, PAYLOMATIC and PAY are registered trademark names of The Frank G. Hough Co.

HOUGH®

. . . for more details circle 316 on enclosed return postal card

PAYLOADER®

PAYLOADER®

Pipe-laying is another of the many ways these

multi-purpose

tractor-shovels can reduce your equipment and operating costs

When you buy a PAYLOADER you have *more* than a tractor-shovel. You have the most *proven* tractor-shovel, and the most *useable* – because of the many and unusual kinds of allied equipment that you can use with it. Several of these tools are available *exclusively* on rubber-tired PAYLOADER tractor-shovels.

Reduces Your Equipment Costs

With this one basic machine of broadest usefulness, you eliminate the big investment in specialized single-purpose machines. You continue to cut costs because you can keep a PAYLOADER busy more hours of the day and more days of the year.

Superior-Hough Sideboom is one of the useful and unusual pieces of allied equipment available exclusively on PAYLOADER tractor-shovels. It is provided for three Models with lifting capacities up to 6 tons at 4-ft. overhang. This Sideboom with 4-wheel-drive mounting can be used on paved streets and highways without damaging the surface. All Sideboom operations are powered by the PAYLOADER hydraulic system – the line winch by hydraulic motor, the booming and boom-telescoping by twin double-acting hydraulic rams. All controls are convenient to the operator at his regular position.

Backhoes are available for front or rear mounting on several PAYLOADER sizes and are recognized as the best-engineered in the industry. One of these can be rear-mounted on several PAYLOADER sizes along with the Sideboom and "4-in-1" Bucket, and any of these three tools can be used on the same job.

Blacktop Spreader interchanges with the bucket and has its own engine power. With hopper capacity of 2 cu. yds., it lays hot or cold mix up to 8-ft. wide and up to 6-in. thick – instantly adjusts for widths up to 4 ft.

Sideboom does not interfere with bucket use

Vibratory Compactor is available for several 4-wheel-drive PAYLOADER models and interchanges with the bucket. It is self-powered and self-contained, and develops maximum densities in all granular soils.

Sizes to fit your needs

From the PAYLOADER line you can select the exact size and type of tractor-shovel that fits your needs and budget because there are eight basic sizes and more than twenty models.

Other Allied Equipment includes earth augers, forklifts, winches, backfill and angling blades, "4-in-1" bucket, snow plows. Your HOUGH Distributor is ready to show you how a PAYLOADER with its multi-purpose usefulness can work economies for you the whole year through.

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY – INTERNATIONAL HARVESTER COMPANY

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER, PAYLOMATIC and PAY are registered trademark names of The Frank G. Hough Co.

HOUGH®

THE FRANK G. HOUGH CO.
768 Sunnyside Ave., Libertyville, Ill.

☐ Send booklet on Hough-Superior Sideboom
☐ Send literature on other PAYLOADER Allied Equipment.

Name _____
Title _____
Dept. _____
Street _____
City _____ State _____

4-B-2

. . . for more details circle 317 on enclosed return postal card

Best of the cranes . . .
best of the diesel pile hammers

ONLY LINK-BELT GIVES YOU BOTH!

Single-source pile driving package opens up new profit opportunities on bridge and structure work!

BEST OF THE CRANES INCLUDES: Full-Function-Design upper that benefits from separate power flows for each crane operation. Boom, hoist, swing and travel one at a time, or all at once. There's also provision for an optional third inhaul line to "snake" in piles.

Speed-o-Matic true power-hydraulic controls govern ALL crane moves. Response is instant, smooth . . . never any jump, jerk or lag.

And there's greater line pull for peak loads; higher strength machinery parts; all-welded, stress-relieved uppers and lowers; increased lifting capacities at extended boom radii.

BEST OF THE DIESEL PILE HAMMERS INCLUDES: All controls at the operator's fingertips. Number of blows per minute doubled over competitive diesel hammers. *Tri-power* cycling provides pile preloading, high impact and two-way explosion. Glow plug and atomized fuel injection for faster starts in cold weather or soft ground.

Low initial investment — no boilers, compressors, or auxiliaries. Choice of 3 hammers: up to 7,500, 18,000 or 30,000 ft.-lbs. per blow. Nation-wide service and parts availability — 120 outlets in the U.S. and Canada.

Take the *single-source* approach to pile driving profitability. See your Link-Belt Speeder distributor. Or write Link-Belt Speeder Corporation, Cedar Rapids, Ia. 110-61N

1936 / 1961 — 25 years of controls leadership

LINK-BELT SPEEDER

LINK-BELT SPEEDER

It's time to compare . . . with Link-Belt Speeder

. . . for more details circle 337 on enclosed return postal card

New Publications

Continued from page 42

MIXTURES ON PROPERTIES OF CONCRETE. Symposium Report STP 266; hard cover, 256 pages; $7.50 (ASTM members $6.00). American Society for Testing Materials, 1916 Race Street, Philadelphia, Pennsylvania.

The use of water-reducing admixtures and set retarders in concrete has grown continuously since their introduction over 25 years ago, with present estimated usage of 25 million cu. yd. annually in the U. S. alone. Further indication of current interest is evidenced by the fact that ASTM Committee C-9 on Concrete and Concrete Aggregates and certain public agencies are actively drafting standard methods of test and specifications to govern the purchase and performance requirements of these admixtures for concrete.

This Symposium consists of ten papers and a summary. Four of the papers represent the joint contribution of four principal producers of admixtures. The remaining papers were prepared by representatives of consumer interests, research organizations and the cement industry.

ERECTING STRUCTURAL STEEL. By Samuel P. Oppenheimer, Professional Engineer, New Jersey and New York. 272 pages, 6 x 9, 111 illustrations, McGraw-Hill Book Information Service, 327 W. 41st St., New York 36, N.Y. $9.50.

Covers modern methods for erecting a wide variety of steel structures, from basic planning of structures to the installation of roof and beams.

Types, names, descriptions, and uses of equipment are described, as well as the many factors in structural erecting such as tools, scaffolding, work methods, erection procedures, and the business aspects of testing, selling, and managing. The book gives information on recent developments in such areas as reinforced concrete structures, the structural steel frame, and miscellaneous iron, including stairs, fire-escapes, and structural door frames.

In addition, the book provides facts on slewing and automotive cranes, welding guns, high-strength bolts, and other types of modern equipment. Illustrations, sample work-control and office forms, and examples of computations add further clarity to the discussions. Written for engineers, architects, construction superintendents and estimators.

CONSTRUCTION ESTIMATES AND COSTS. (3rd Edition). By H. E. Pulver, Consulting Engineer, Emeritus Professor of Civil and Structural Engineering, University of Wisconsin. McGraw-Hill Book Information Service, 327 West 41st St., New York 36, N.Y. 640 pp., 6 x 9, 126 illustrations. $12.00.

How to estimate the cost of any type of construction job – either light or heavy—is covered in detail in the newly published revision of a book that has been in use for 20 years.

Various aspects of construction work, such as handling and transporting materials, excavation, piling and bracing, concrete, masonry, wood work, structural steel, roofing, heating and air conditioning, plumbing, electrical work, lathing and plastering, painting, etc., are covered in much detail.

This revision gives new data on asphalt walks, driveways, and pavements and includes the latest data on wages, materials, prices, and estimating methods. In addition, it presents a new and different method for computing equipment ownership and operating costs, and contains many complete illustrative estimates.

GLUED LAMINATED TIMBER FOR BRIDGE BEAMS. By K. O. Tamberg and M. W. Huggins. Report of investigation conducted by the civil engineering department, University of Toronto, in cooperation with the Ontario Department of Highways and under the Ontario joint highway research program. Report No. 11, 1960.

Is YOUR Heating System Out-Dated?

IF SO, IT'S TIME TO MODERNIZE WITH A

CHILDERS ALL-IN-ONE

COMPLETE IN ONE COMPACT UNIT
Asphalt System
Dryer Fuel System
Automatic Heating System
Pumping System
Automatic Controls
Heater Fuel Tank

CHILDERS MANUFACTURING COMPANY, INC.

FACTORY AND MAIN PLANT
P. O. BOX 6185 - STATION B
ALBUQUERQUE NEW MEXICO

EASTERN DIVISION
P. O. BOX 4587
RICHMOND 29 VIRGINIA

. . . for more details circle 294 on enclosed return postal card

Only eight hours transmission downtime per unit in approximately 2700 hours of operation over a period of 2½ years averages out to

99.71% AVAILABILITY!

A. F. Keyes Co., Inc., South Milwaukee, Wisconsin, is using Fuller 5-G-1520 5-speed Transmissions in four Le Tourneau-Westinghouse Scrapers on construction projects in southwestern Wisconsin. None of the four units has had more than eight hours of transmission downtime—and each has logged more than 2700 hours of operation.

Two of Keyes' L-Ws are Model B Full Packs, and two are Model B BM-2s. The constant-mesh, spur-gear Fuller 5-G-1520s feature, as standard equipment, the Fuller air-actuated countershaft brake, which permits quick, easy up-shifts without double clutching. Also standard on the 5-G-1520 is the Fuller pressure lubrication and filtration system, which keeps gear oil clean, provides longer gear and bearing life and increases availability for your operation.

Bernard Schuh, Chief Mechanic for Keyes, says, "We're extremely pleased with both the performance and reliability of the Fuller 5-G-1520 Transmission. If you buy a good piece of equipment and take care of it, it's going to perform profitably for you. And that's certainly the case with the Fuller Transmissions in our LeTourneau-Westinghouse Scrapers.

FULLER TRANSMISSION DIVISION

EATON MANUFACTURING COMPANY

KALAMAZOO, MICHIGAN

Sales & Service: West. Dist. Branch, Oakland 6, Cal. • Southwest Dist. Office, Tulsa 3, Okla. • Automotive Products Co., Ltd., Brock House, Langham St., London W.1, England, European Rep.

. . . for more details circle 307 on enclosed return postal card

The voice of 18 years' experience says—

"THIS CEDARAPIDS G40A IS THE

Cedarapids
Built by IOWA

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa

IOWA MANUFACTURING COMPANY, Cedar Rapids, Iowa

Gentlemen: Please send the literature checked

- ☐ Bulletin AP-26 (Portable G-Unit Plants)
- ☐ Bulletin AP-27 (Stack-Up H-Unit Plants)
- ☐ Bituminous Pavers
- ☐ Aggregate Plants

Name_____

Company_____

Address_____

City_____ State_____

Send for these bulletins

Whether you need portable plants for jobs-on-the-move, or stationary plants for localized markets, these two bulletins contain valuable information about all Cedarapids batch-type models, including production-balanced accessory equipment.

BEST PLANT ON THE MARKET"

The voice is LYLE HARMON, Vice President
KINGSPORT ASPHALT CORP.
Kingsport, Tennessee

After 18 years in the bituminous mixing and paving business, the vice president of Kingsport Asphalt Corp. is well qualified to judge the comparative performance of asphalt plants. When Mr. Harmon calls his Cedarapids G40A "the best plant on the market" he knows what he's talking about. Mr. Harmon adds, "We find no bottlenecks with Cedarapids equipment. All components such as drier and dust collector are proportioned just right." On the job shown at the left, Kingsport's plant is mixing surface type 104 and binder to meet strict Tennessee state specifications and is producing an average 200 tons per hour.

For "best plant" performance, it will pay *you* to investigate the advantages of Cedarapids Bituminous Mixing Plants. They're packed with profit-benefits that reduce your cost per ton. Among these benefits are all-automatic controls, including new automatic burner controls, on the G-Unit and H-Unit models to speed operations and give you two or three extra batches per hour; a long, wide pugmill mixer with a spiral paddle pattern that assures faster mixing and handles larger batches; Cedarapids-Quality construction throughout to cut maintenance cost; and a complete line to meet every capacity requirement from 1500-lb. to 7500-lb. batches. Three G-Unit models are 100% portable and self-erecting. Six H-Unit sizes are stack-up models for stationary installation. Three sizes of continuous mix plants are also available.

5361N

Kingsport benefits with new automatic drier control system

To meet strict specifications, Kingsport insists on positive quality control through every production step. One of the most important control centers is the automatic drier burner control system which regulates burner firing to meet varying drying conditions and assures close temperature control of dried aggregate. And you save money and headaches! You get up to 10% fuel savings, eliminate possible human error, eliminate load rejections due to low temperature, and your burner man is free for other productive jobs.

Add a Cedarapids Paver for a high-profit "paving package"

For profitably laying the mix produced by your Cedarapids asphalt plant, use the machine that revolutionized the concept of bituminous paving. The Cedarapids Paver's unique design applies the principle of high frequency screed vibration to insure high speed laying of smooth, densely compacted mat free from voids or surface tears. Elimination of the old fashioned tamper bar reduces the number of moving parts to reduce maintenance requirements. High frequency vibration is only one of the many exclusive features which have led so many asphalt plant owners to complete their Paving Package with a Cedarapids Paver.

. . . for more details circle 324 on enclosed return postal card

THERE HAS TO BE MORE THAN EASE IN LIFTING A LOAD!

TOO OFTEN, we think, emphasis is placed on only easy operation in crane work. Or on the speed of a hoist line or the length of boom! These things are only a part of the many requirements imposed by the extra demands of varied crane jobs under difficult conditions or for bucket work or pile driver work involving fast production schedules.

Pictured is a 40-ton Model 6 Northwest Lifting Crane and a 50-ton Model 95 Lifting Crane erecting an entirely precast structure. This was not a matter of weight. Either machine could have easily lifted the 23-ton pre-stressed beam. Here smooth teamwork accelerated the flow of the job, gave greater safety to the men on the structure and reduced the danger to the highly stressed beam.

Northwest Cranes fit themselves into jobs like this. Here the true "feel" of the load that comes with Power Feather-Touch Main Drum Clutch Control is highly important. The smoothness of the Northwest Independent High Speed Boom Hoist in hour after hour booming pays dividends. The positive velvet action of the Uniform Pressure Swing Clutches that gives you smooth swing where a jerk could wreck a beam means time and money.

These are just a part of the many Northwest advantages that get the job done faster. They are among the things that let you say, "That Northwest is always ready to go"— the advantages that make Northwest Cranes the finest machines of their kind.

NORTHWEST 3/4 to 3 Cu. Yd. Capacity

CRANES • SHOVELS • DRAGLINES
PULLSHOVELS • TRUCK CRANES

. . . for more details circle 342 on enclosed return postal card

NORTHWEST ENGINEERING COMPANY
1504 Field Building • 135 South LaSalle Street • Chicago 3, Illinois

C-6-27-1C

Editorial

Contract Volume And Profits

An editorial in "The Central Constructor," official publication of Associated General Contractors of Iowa.

REMEMBER the story about the old Ottumwa cigar maker who used to say that his five-cent cigars were so good that he lost money on every one he made and that it was only the tremendous volume of his business which kept him from going broke.

Oddly enough, there are a few contractors who seem to operate on very much the same theory, or at least they approach that theory in their puzzlement over how much they can add to their known costs of doing a job and still remain competitive in the bidding.

As a consequence, quite a large number of contractors have embarked upon a "small profit, large volume" basis of operations. This is not necessarily an economically suicidal procedure. (Woolworth proved its possibilities—at least for retail merchandising—in his dime stores.)

But the contractor who ventures onto that path should know what he is going to be up against if he hopes to remain solvent. He can't go all the way over to the old cigar-maker's business notion.

The Weekly News Letter of the Builders Exchange of Akron, Ohio, has published a chart to show exactly what is necessary to success in the "small profit, large volume" course of operations:

"A 20 percent cut means a 400 percent increase in volume to make the same profit obtained before the price was lowered," the charts sets forth. That is to say, the contractor who in the past has figured his costs and then added 10 percent to them to reach his bid figure, and who now decides that to meet competition he is going to add only 8 percent to his costs, must be prepared to take a 400 percent increase in the volume of work he performs in order to bank the same number of dollars in profits he was earning on the 10 percent markup system.

The chart shows that if he cuts markup 3 percent, he must boost volume 13.6 percent. If he cuts 5 percent, volume must go up 25 percent; for a 7 percent cut, up 42.8 percent; for a 10 percent cut, up 67 percent; for a 15 percent cut, up 150 percent to maintain the same profit income.

Of course, the rule works in reverse, too. If you could increase your markup—add a higher percentage to your cost figures when bidding—you'd make the same amount of profit on smaller volumes of work.

If, for example, you increased your markup 3 percent, you could make the same profit on 90 percent of the same volume. A 5 percent increase would let you reduce to 83.5 percent of the volume; a 7 percent increased markup would mean the same profit on 77 percent of the volume; 10 percent increase, 71.5 percent of the volume; 15 percent increase, 62.5 percent of the volume; and 20 percent increase, 55.5 percent of the previous volume.

This is nothing new—simply applied mathematics. There have been operators, of course, who have seen their chance for a "one-shot killing," a heavy addition of percentage to their cost estimates which would permit them practically to retire on the one venture.

But construction today is keenly competitive. There aren't many "silver platter" jobs being handed around. A contractor must figure closely at best to be in the running when bids are opened, but, whether he's going after large or small profits on each project, he should know what the multiplication table holds over his head.

Completed subbase being used as a high-speed haulway for long borrow hauls on the I-15 project in Southern California. Note absence of dust, indicating good control of moisture in this base layer until paved over.

Water for Super-Hot Desert Freeway Job

Deep well pumps, reservoirs, long pipeline and wayside tanks kept the sprinklers going

Invite a western contractor to bid on any arid-country grading job, and the first thing he thinks about is—water! When the job traverses a shimmering desert, with 125-degree heat, and stretches out for many miles, water supply becomes a really serious element of project planning.

Such a project is the 26-mile segment of Interstate 15, under construction recently north of Baker, California toward Las Vegas. This job which will dualize existing US 91-466 as a freeway, entailed 2,000,000 cu. yd. of roadway excavation, borrow and base aggregate placement—all needing compaction moisture. Aside from the great length of this stretched-out job, the intense heat of summer and the near-zero humidity spelled huge water gallonages. A daily supply of upward of half-million gallons was seen necessary for soaking borrow pits, wetting cuts to ease ripping, and keeping dirt and base material at optimum during and

Pumped well water being fed into million-gallon Reservoir No. 1 on the Ball-Simpson-Yaeger freeway project.

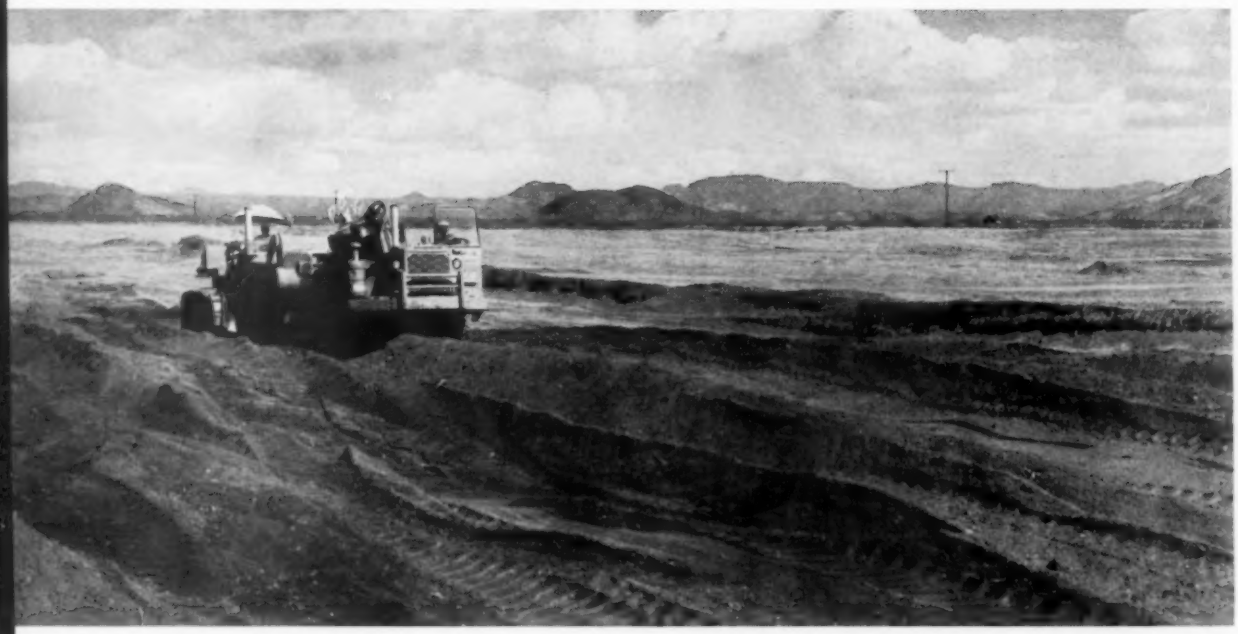
Repumping station at Reservoir No. 1—a GM Detroit Diesel 500-gpm unit.

following rolling. Haul road sprinkling alone added up to a steady job for big sprinklers.

Successful bidder on this project early in 1960 was the combine of Gordon H. Ball, Gordon H. Ball, Inc., Ball & Simpson, E. L. Yaeger Co., and E. L. Yaeger Const. Co., Inc. Their bid price for water in this $5 million complete package project was $1.14 per M (thousand) gallons, for the 76,000 M gal. estimated water needs.

The major job quantities were 790,000 cu. yd. of roadway excavation, 825,000 cu. yd. of imported borrow, and 352,000 cu. yd. of California Class A base material. These quantities were chiefly for a new two-lane roadway paralleling the existing US 91-466. Except for one large hilltop cut, excavation was shallow, and filling likewise shallow and well scattered through the project. Most of the roadway excavation called for scrapers.

One of the big sprinklers in action—a Southwest 8,000-gal. unit with Cat DW20 tractor.



In one of the Ball & Simpson borrow pits. Loose sand-gravel being loaded into the DW20—No. 459 unit by a D9 pusher, aided by straddling of loose windrow left from previous loading passes. This pit was not watered, but rainbirds were used for soaking borrow areas involving finer soils.

Scales were located at two pits for weighing out scraper loads of base gravel.

The relatively large borrow yardage, made necessary by bridge approaches and frequently raised grade, was to come from several wayside pits. The average haul for all grading was about three miles, one way, with considerable borrow material requiring hauls up to five or six miles.

The Ball-Simpson group, which took over the grading end of the job, brought in fourteen Caterpillar DW20 tractor-scraper units, using No. 456 & 482 and also some of the new smaller 619 pans. Also six motor graders (Cat 12s and 14s), a number of D8s and D9s, and Southwest and Bros rubber-tired compactors. Working in generally sandy or sand-gravel soil these machines handled 20,000 cu. yd. per two-shift day at peak despite long hauls. The grading began at the north end, working downhill across a depression, up over a summit, and on down to low elevation at the south end.

This grading progression, and also the base and paving work which followed closely (see "380,000 Ton Desert Freeway Asphalt Job," Roads and Streets, January, 1961), were dictated in part by the advantage of watering the job by gravity from wells and reservoirs located at high elevation points, i.e., the high north end of the job and the above-mentioned summit. The scheme was to repump from well-fed reservoirs at these two high locations, and with the help of booster pumps but principally by gravity, pipe water to 10,000 gal. watering stations spotted along the job at half-mile or larger intervals.

Reservoir No. 1, at the north end, was dug to about a million gallons capacity and supported by four submersible well pumps, each capable of delivering a steady 100 to 135 gpm. Water was reached at depths of 200 to 225 ft. at this site, situated near the base of a long, gentle talus slope. Water was sent through the pipeline by a General Motors Detroit Diesel pumping unit of 500 gpm capacity.

The main water line consisted of 102,000 lin. ft. of 6-in. steel pipe with welded couplings. At about milepost 6 from Reservoir No. 1 a booster pumping station (also GM Detroit Diesel) kept reservoir No.

Continued on page 88

Better Climate for Contractors AGC Convention Theme

A better business climate for the nation's contractors was the keynote as members of the Associated General Contractors of America met in Boston, February 27 through March 2, for their 42nd annual convention. Acting president M. Clare Miller, Kansas road contractor, adopted this theme in his opening-session remarks, mindful that the contractors had just come out of a rough 1960 and were hoping for better profit showings in the season opening up.

"Volume alone is not the contracting industry's answer," he emphasized, "but rather contractors must adjust their thinking and actions to a proper return regardless of volume." This observance was made at Boston as contractors were rolling up sleeves for a record or near-record dollar volume of construction in 1961. (The biggest "spark": a 50 percent rise in highway jobs compared with the first weeks of 1960.)

The 1,000 or more contractors attending the convention heard top-level speakers on topics vital to the industry's future. Some of the highlights:

1. The great future construction needs of the nation were touched on by Luther H. Hodges, Secretary of Commerce. He particularly cited the need for new schools and for millions of new homes, and the huge urban renewal job. He pointed to President Kennedy's program with its emphasis on stepping up the road program and other new activities that will generate construction.

Secretary Hodges won applause by saying "We are taking a new hard look at our tax laws . . . we need provisions bearing on depreciation allowances to stimulate rather than retard the investment decisions of industry."

2. Echoing Secretary Hodges, another top speaker, Erwin D. Canham, Editor of the Christian Science Monitor and former president of the U.S. Chamber of Commerce, said "there must be quicker depreciation allowances so that our obsolescent plant and equipment can be replaced."

3. An emotional lift was given the audience by AGC's own John A. Volpe, Governor of Massachusetts and president-elect of the association until his resignation to take public office last November. Volpe who is a building contractor and former interim Federal Highway Administrator challenged contractors to take greater part in public affairs, and not to become too involved in private business to deter them from running for public office.

"Remember, you can't take it with you. The satisfaction you get from serving your fellow man will more than compensate for the loss in monetary returns."

Governor Volpe urged the AGC members to reread their association's code of ethical conduct adopted in 1925, and to "follow this code as if it were a holy scripture." Lack of integrity in government, of ethics in management and labor, and of patriotism by Americans can lose this nation a great future of prosperity, he said.

"Hot Highway Session

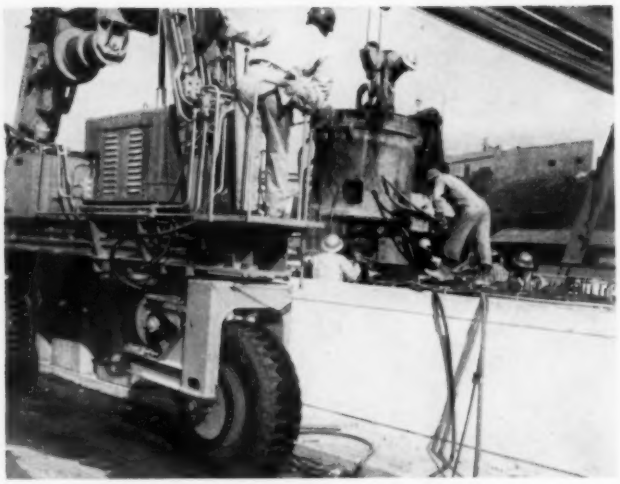
For road contractors the top attraction of the four-day-long convention was the Highway Session. With H. L. Royden, of Phoenix, retiring chairman of AGC's highway division presiding, this session began with a report on division activities by James M. Sprouse of AGC headquarters and closed with a panel discussion by Washington leaders on the legislative outlook. Some of the pertinent details:

1. Joint committee action between AGC and the National Bituminous Concrete Association has borne fruit. This group's co-chairman, D. J. O'Connell of Holyoke, Mass., said that the quality-conscious NBCA contractor group has broadly endorsed with AGC the end-result principle for performing bituminous paving work. The committee is studying the respective merits of mixtype versus penetration macadam paving. Also a committee goal is the securing of more uniform characteristics in asphalt cement from the various refineries.

2. Bureau of Public Roads requirements for inspection and for acceptance and record tests were taken up briefly. B. B. Armstrong of Roswell, New Mexico, who heads an AGC task committee on this subject, reported that the confusion created last year by Memo 20-5-60 of the Bureau has now been largely clarified by the Bureau's supplementary memorandum of January 16, 1961. This latest memo, which AGC has circulated to its membership, represents a promise kept by deputy commissioner George Williams last October at the association's board meeting at Phoenix.

The most important points covered in the January 16 memo: (1) The original 20-5-60 statement was not intended to change in any way contract provisions in force on projects, or change accepted, established procedures. (2) The procedures are to be interpreted and administered with the same sound

Continued on page 104



General view of unique gantry Travelift carrier for handling beams, forms, concrete buckets, etc.

Big Viaduct Job Puts Contractor In Prestressing Business

When the Griffith Company of Los Angeles won all three contracts for a three-mile-long freeway viaduct connecting the Santa Ana and Harbor Freeways in Los Angeles, the firm went farther than to merely handle this whopping $26 million in state highway work. It also set out to become a likely nominee as the firm with the nation's finest concrete prestressing facilities.

The structure work in the combined job includes casting and placing 833 box, "T" and inverted "T" or hammerhead beams ranging up to 93 ft. in length. This was enough work to justify the Griffith firm in setting up of its own prestressing operations. With an eye on the increasing use of prestressed structures, the company put together a prestressing facility which in efficiency, if not in size, must be considered one of the most advanced in the industry.

Casting Yard "Out Ahead"

The prestressing facility is made up of two parallel 400-ft.-long beds—respectively 26 and 30 ft. wide. Bed and abutment design permit each bed to be used for fabricating three lines of beams. Stressing is done by hydraulic Stressmatic equipment. The two beds are 50 ft. apart, allowing room for maneuvering the firm's cement trucks, hydraulic cranes and two Travelifts in the materials handling scheme.

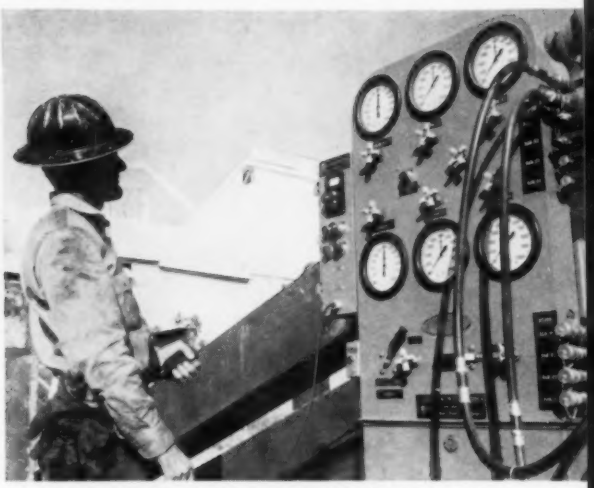
Underneath the 8-in. slab making up the deck of each bed are 2 ft. wide by 4 ft. deep concrete foundations, extending lengthwise under each prestressing run to prevent bed settlement. A 2-in. deep by 13-in. wide key in the slab directly over these foundations has threaded inserts that extend into the foundations. Designed for tie-down use for the construction of "T" beams, they are located on 12-in. centers so that the beds can be accommodated to a variety of deflected designs.

There is a key for each beam run in each bed. However, construction of box beams not requiring deflected tendons and tie downs is handled by placing a prestressed 3⅝″ x 36′ wide concrete soffit over the key. These soffits, cut into sections for easy handling and storage, provide a floor for construction of box beams, yet do not eliminate the use of any of the bed facilities for the construction of deflected tendon beams.

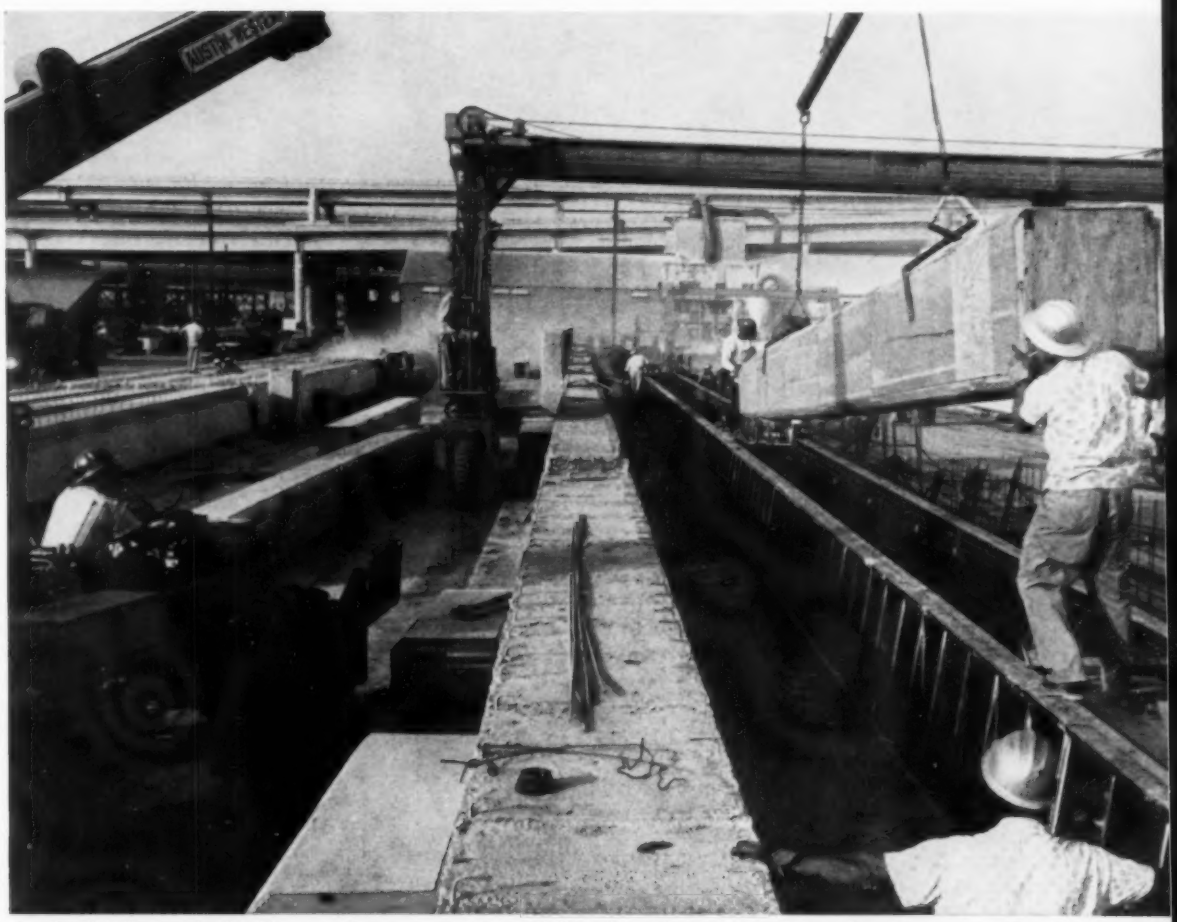
The abutments and forms were fabricated by Food Machinery Co. in San Jose. Each abutment has an 800-ton stressing capacity and is supported by six 30′ x 36″ poured-in-place piles. The abutments also seat in a recess of the slab which deepens to a total of 4′ 6″ along the bed ends.

Handling Stressing Cable

The Santa Monica viaduct job calls for the use of 7-strand, ½-in. pretensioned cable. John A. Roebling's Sons and Colorado Fuel & Iron are supplying the 2.5

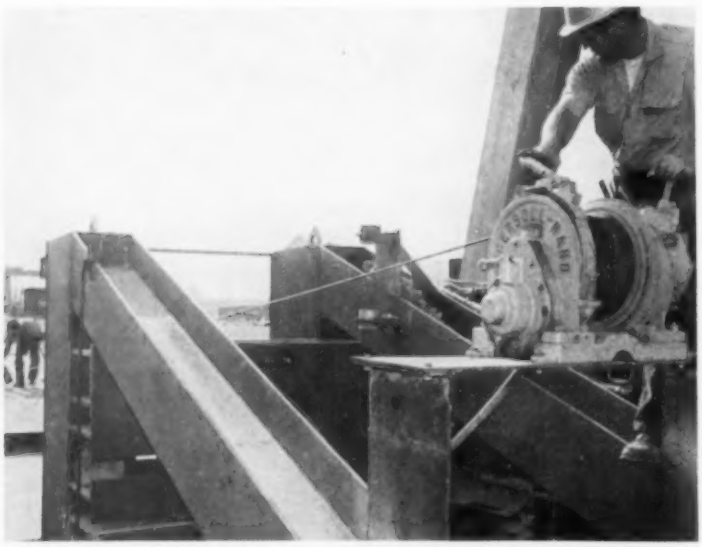


(Left): Cable storage and handling are simplified with 10 reel motorized carrier which rolls on rails across the end of the prestressing beds. (Right): Hydraulic stressing equipment, made to Griffith Co. design by International Prestressing Corp.; includes the Stressmatic which automatically reverses hydraulic ram action after target gauge level is reached.



An Austin-Western hydraulic crane lowers a wooden "void" or inner form section into a place for casting a box beam. Part of a casting yard described as one of the modern in the business.

(Left): Ten cables at a time are pulled down the beam run with the aid of this novel "basket." (Right): Hydraulic ram stresses tendons, one at a time, one per minute.



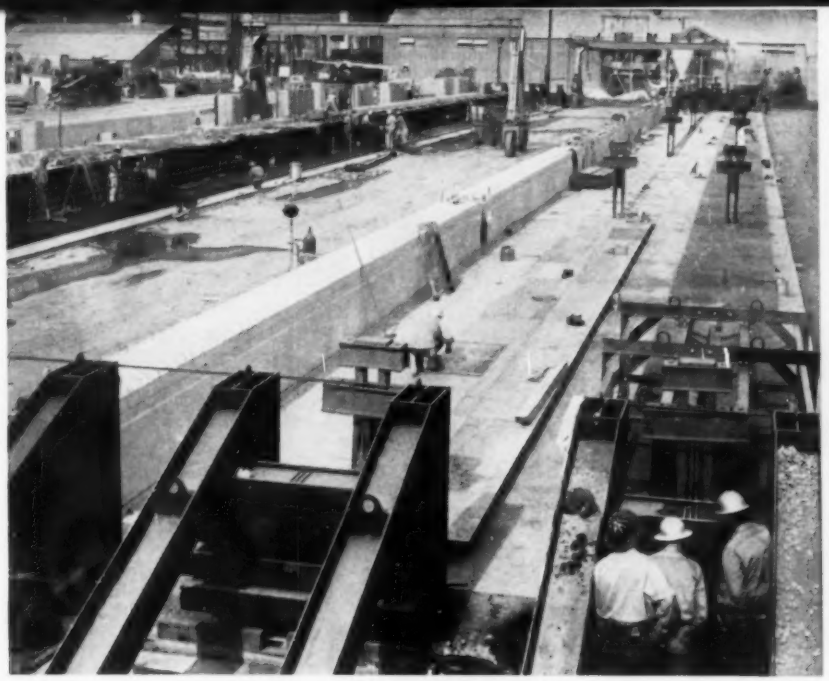
(Left): Ingersoll-Rand air-tug is used to pull 10 cable tendons at a time the length of the 400-ft. bed prior to stressing. The air-tug and its bracket are moved from abutment to abutment as needed. (Right): Tendons for "T" beam have been run and are ready for initial stressing. After stressing, hydraulic ram pulls tendons to deflected position, thereby completing stress.

million 1 in. ft. of strand that will be used for prestressed beam tendons. The 9,000 ft. reels of cable are loaded on a rail-mounted self-propelled carrier capable of holding 10 such reels. Running past one end of the two beds, this carrier simplifies cable storage and speeds movement and handling.

The cable is pulled, 10 tendons at a time, with an Ingersoll-Rand air tug bolted to brackets on the abutments at the opposite or stressing end of the beds. Supreme chucks are used to secure both ends of the cable after they pass through the appropriate cable holes at each abutment.

Design and construction of the beds and abutments assumed the extensive use of the hydraulic Stressmatic. Accordingly, hydraulic lines for the Stressmatic ram are located at each of the six stressing abutments. Hydraulic and pneumatic lines are also spotted every 50 ft. along each side of each bed, to speed and simplify use of pneumatic equipment and the use of vertical hydraulic rams for deflection of tendons.

With the tendons strung, the ram is slipped over a 4-ft. tail of cable protruding from the Supreme chuck at the back of the stressing abutment. After setting target gauge pressure (reading in lb. of stress)—in this instance, 25,000 lb.—the operator presses the "start" button on the Stressmatic console and then presses a hand-held control switch. The hydraulic pump quickly charges the ram and the ram's action draws the tendon to target pressure, then automatically releases. In another 30 seconds the two-man crew



Each of two 400 ft. long beds has provision for three beam runs. All runs are designed with tie-downs at one-foot intervals for deflected design beams.

Two-yard buckets of cement are handled quickly and inexpensively with this modification of a Mack BX dump truck. Note that dump mechanism has been reversed to provide lifting action.

handling the ram have it placed on the next cable for stressing. Tendons are stretched in this fashion, one at a time, at the rate of one a minute.

Where tendons are to be deflected as in "T" beam design, stress factors are calculated against down coefficients of elongation. Tendons are stressed to a calculated limit, then deflected to design requirements, thereby bringing stress to ultimate target level.

With two widely separated beds in simultaneous operation, the significance of Griffith's choice of design and equipment becomes fully apparent. While the Austin-Western hydraulic cranes reach clear across three rows of beams for placement and removal of forms, the self-propelled Travelifts provide the flexibility of an overhead crane for handling cement buckets. Even when both beds are going full blast, there is virtually no sign of congestion. By straddling the beam runs, the Travelift can service three rows of beams almost simultaneously, with one-man operation.

In the case of box beams, 5/8-in. steel strapping is run under the bottom tendons at 10-ft. intervals along the box. This is done to provide tie-down for the wooden void that will be poured in place after the bottom pour has been made. With bulkheads in place at the beam ends, and the steel forms in place, the pour commences. Vibration of forms is provided by Martin Engineering pneumatic vibrators clamped to a vibration bar welded to the outer flanges of the forms. Additional vibration is provided by convention vibrators dropped in be-

Continued on page 112

Tandem pushing with D9 Tractors...
"WE'RE 25% AHEAD OF SCHEDULE"

V. H. RIEKE, SUPT.

It's a case of a good thing made even better. Grosshans and Peterson Inc., of Marysville, Kansas, have long been sold on the advantages of tandem loading. Now they are more enthusiastic than ever. The reason? Their new tandem pushing equipment. Vincent H. Rieke, superintendent on the contractor's two million yard Interstate 235 job near Wichita, reports, "Our two new Cat D9E power shift Tractors with Pushin'-Cushin'* attachments have increased our pusher production 20-25% over our older uncushioned units. We've had to bring in two more scrapers to keep up the pace—are 25% ahead of schedule."

The Cat D9E Tractors in tandem get full loads . . . fast loads. In addition to power, two factors ideally suit the D9 to this task: the power shift transmission permits split-second, on-the-go speed changes with finger-tip ease to meet changing load requirements; and, the special pushloading equipment allows smooth, on-the-run contact with scrapers, eliminates dead seconds from loading time.

Tandem pushloading may be a real money-making proposition on your job. Your Caterpillar Dealer will be glad to discuss job requirements, demonstrate the D9 and its complete line of pushloading equipment. See him soon.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

* Mfd. by Pushin'-Cushin', Inc., Perry, Kansas

WHY D9E GIVES YOU EXTRA PROFIT ON EVERY JOB

POWER 335 HP turbocharged D353 Engine provides muscle for big loads, is dependable and economical.

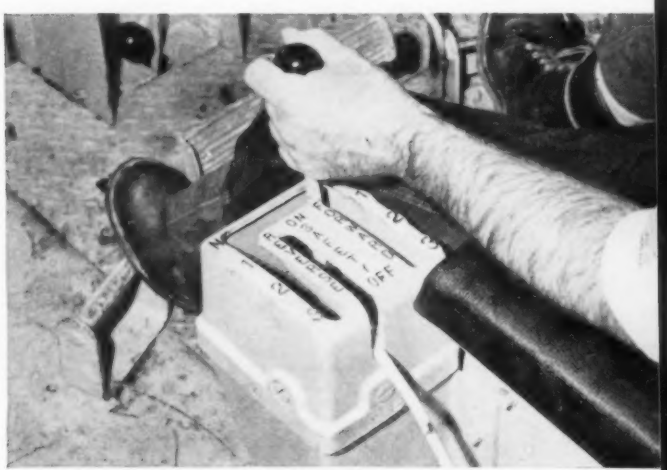
MASSIVE UNDERCARRIAGE New high in durability. Quality materials and selective heat treating extend life on toughest jobs. Cam-type equalizer bar provides superior sidehill stability, increases operator confidence.

TORQUE-DIVIDER POWER SHIFT TRANSMISSION (optional). Shift on-the-go in a split second with finger-tip ease . . . even under full load. Exclusive torque divider combines anti-stall characteristics of a torque converter with operating snap of direct drive.

PLUS: Lifetime lubricated track rollers, easy-to-service dry-type air cleaners, convenient hydraulic track adjusters. Unexcelled operating ease, comfort and safety.

Caterpillar offers the most complete line of big-tractor attachments and tools available to keep your production profitable.

Smooth on-the-go contact . . . up to 3 MPH! Pushin'-Cushin'* is one of several specialized pushing attachments available for the D9E. Attachments like this increase the machine's usefulness.



The Cat power shift transmission is designed to give you plenty of power fast in the highest gear possible. Ease of shifting lets operator get more work out of the tractor, lessens his fatigue.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BOOST PRODUCTION WITH D9 PUSHER TRACTORS

. . . for more details circle 291 on enclosed return postal card

Paper curing helps protect the slab from extremes of either cold or heat, during the important curing period when control of internal temperature as well as moisture retention is important to concrete quality.

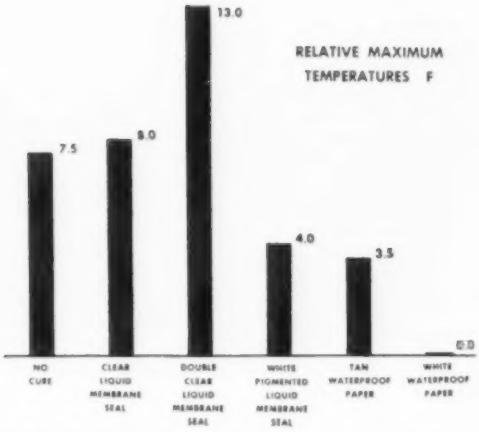
How Improved Paper Curing Helps Get Better Concrete

By J. M. Cummings
Product Manager,
American Sisalkraft Corporation

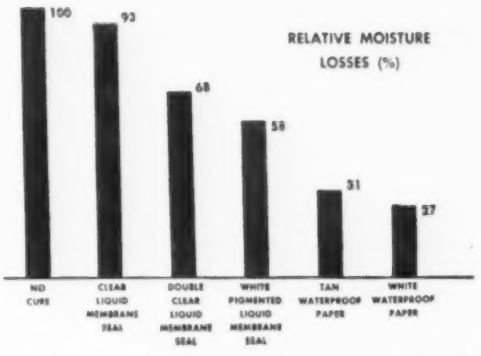
Concrete may be made with the best aggregates and mixed in exactly the right proportions, but it still must be cured properly if the expected slab strength, durability and surface resistance are to result. There is no alternate to proper curing; the method of curing and the manner in which it is carried out affect quality, cost and maintenance too seriously to be ignored.

The curing phenomenon is hence worth a moment's quick review. In the formation of concrete, a chemical reaction occurs as water combines with cement and aggregate. This reaction—called hydration—initially is quite rapid. Then, under favorable conditions, it slows down but continues for a long period of

Improved blankets of kraft paper today cut job labor cost as well as insuring development of full pavement strength and durability characteristics.



Number of degrees of temperature increase occurring in the concrete during curing with various methods, compared with white waterproof paper.



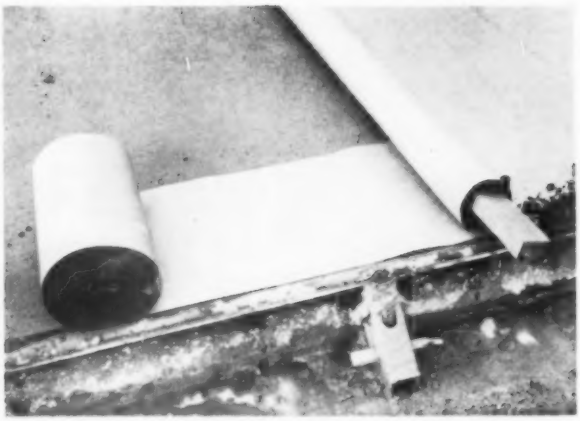
Relative moisture loss (in %) occurring with different curing methods as compared to "no-cure."

time, sustained solely by the presence of water that has remained unhydrated or chemically combined. As long as hydration continues the strength of the concrete continues to increase. When free water in the concrete is gone, the reaction stops. To induce fullest strength, therefore, it is imperative that the water be retained at least until the desired concrete properties have developed to specified levels. In some cases a 72-hour period is considered by some engineers to be ample, but most contend that the concrete should be protected as long as 14 days during winter concreting work.

Besides the difficulty of determining the moisture content of the aggregate at the precise moment it is mixed, there are numerous other factors that complicate efforts to control hydration. The reaction itself generates heat which in turn lowers the moisture content of the mix. Inclement weather obviously presents problems. So do atmospheric temperature and humidity. If the air is below freezing, there is a risk of frost damage or at least retarded hardening. If the weather is very hot, the concrete dries and sets or stiffens more rapidly; shrinkage is more prevalent, and strength may be reduced especially at the surface unless moisture is retained and the concrete protected during curing. Controlling the temperature differential in the slab with respect to the air, in fact, is an indivisible adjunct to controlling moisture content.

Hydration will continue by retaining the moisture already in the mix, or by adding water immediately after the surface of the slab sets. The latter is conceded to be the better of the two but not necessarily the cheaper. Ponding when properly done, sprinkling or applying such coverings as wet burlap effectively cools the concrete and produces higher quality.

In past years, ponding was a popular curing method in this country principally because of the excellent properties it produced in the slab, and because labor costs were more incidental than they are



An edge strip in place, ready to slip outward and down, to cover the exposed slab edge when forms are pulled.

time	Air Temperature (degrees)	Concrete Surface-Temperatures Under Sisalkraft (degrees F.)	Under 12" of Straw (degrees F.)
5 PM	30	40	41
6 PM	31	41	44
7 PM	29	41	44
8 PM	25	39	41
9 PM	18	38	42
10 PM	18	38	36
11 PM	20	38	42
12 PM	18	37	40
1 AM	14	36	36
2 AM	12	36	40
3 AM	14	35	35
4 AM	14	35	35
5 AM	17	34	40
6 AM	16	34	34
7 AM	16	34	38
8 AM	19	36	48
9 AM	28	41	53
10 AM	31	42	54
mean temperatures	20.8	37.5	41.2

How paper blanket protects fresh concrete on a cold day, compared with straw. The 4 degrees additional concrete temperature is indicative of the extra protection afforded by modern curing paper blankets.

today. Now, however, it is subordinated to other methods, is used merely as the base for comparative ratings. Admitted, many European countries continue to specify it or closely allied methods. For example, construction of Germany's autobahns in the mid and late thirties gave impetus to mechanized trains devised to constantly spray a fine mist of water on the concrete immediately after initial set. This method produced a durable pavement with exceptionally good weather and traffic resistance.

Most U.S. contractors and engineers today prefer to cure by retaining the moisture already in the mix. This is done by covering the pour with wet burlap, paper, or a pigmented spray membrane. Compared with ponding or sprinkling, these methods offer significant cost advantages especially in time and labor. Once covering is done, men can be assigned to other jobs without concern about having to wet it periodically. This has particular appeal to contractors; for, curing done by sprinkling or by the application of wet burlap or straw requires close attention, so that the material does not dry out and act as a wick, drawing moisture from the mix.

Ponding regardless of its effectiveness has been set aside in this country because of the demand for high production and the importance of labor rates. Membrane can be sprayed much faster and therefore more economically for the contractor.

Membrane Curing Compounds

There are several types of membrane curing compounds on the market; wax and resin base, clear (some with a fugitive dye to check proper coverage) and white pigmented.

In usage, white pigmented wax base material predominates over the others. When properly applied with a mechanical form-mounted spray machine, the coverage is fairly uniform and accurate. Moisture retention is considered adequate and solar heat reflectively is good. There is, however, little or no insulative effect that provides the retention of heat of hydration and insures a more uniform temperature within the concrete slab.

A difficulty in applying wax base membrane is the need to protect the formed or sawed contraction joints, since joint sealing compounds otherwise would not adhere to the joint's sidewalls. In many cases, this means sand blasting the joints before sealing. This same problem exists when painting traffic lines, for paint is another material that will not adhere to a wax base membrane.

Clear membrane is seldom specified any more as a curing material. Proper coverage is too difficult to check. The covering doesn't reflect solar heat, and doesn't retain heat of hydration and mix moisture adequate for proper curing.

Paper Curing Method

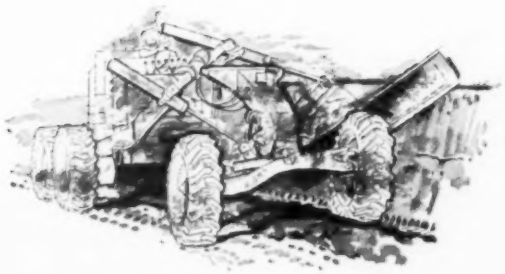
Many improvements have been made in the waterproof reinforced paper method of curing since its inception 30 years ago. These relate principally to materials and methods of application.

Typical combinations produced by American Sisalkraft Corporation, for example, do not shrink, they have low vapor transmission rates and excellent reflectivity, resist puncture and tear, and have very high tensile strength, wet or dry. These properties account for a high number of re-uses with accompany-

Continued on page 70

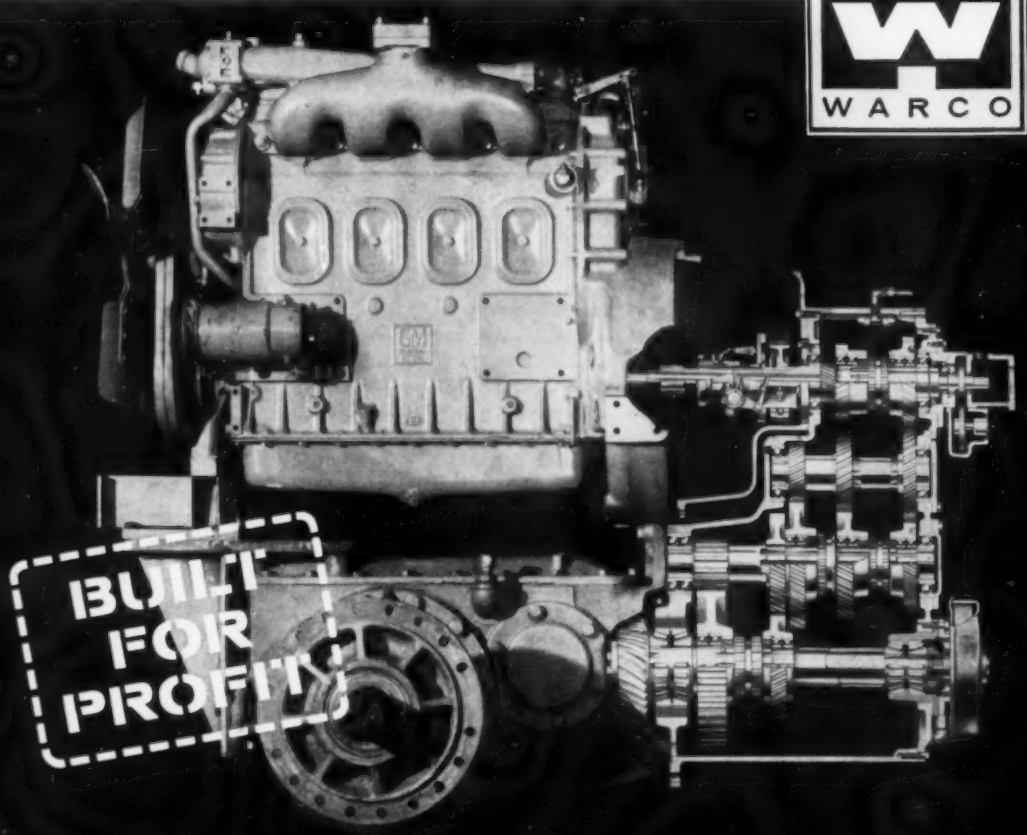
Easy shifting at all speeds

With motor graders, ease of operation means a better job. Huber-Warco motor graders are designed to make the operator's job easier. This is one reason for Huber-Warco's significant improvement to the mechanical transmission — constant mesh, including range shift. This means the transmission assembly receives the torque output of a diesel engine and converts it to a wide range of power and speed combinations to suit any grading job. It permits easy and sure shifting at all speeds. By moving only one lever the operator can change direction in the same gear. There are six speeds forward, six reverse; what's more, optional creeper gears mean extra slow speeds. Ball and tapered roller bearings, constant pressure flood lubrication, helical gears, interlocked shift rails are but a few of the many other features you get with Huber-Warco constant mesh transmission. For real operator satisfaction, peak performance and efficiency, for every grading job, why not talk to your Huber-Warco distributor soon?



HUBER-WARCO COMPANY • MARION, OHIO, U.S.A.

HUBER W WARCO



PAPER CURING

Continued from page 68

ing low "per square yard" material cost. Curing blankets are produced in widths to fit the slab, in lengths to facilitate handling, and to conform to transverse contraction joint spacing. They are sold in rolls with 2″ x 3″ or 3″ x 3″ timbers as the core for ease of handling. Supplemental stringer sheets, 18″ x 24″ wide, are used along the slab edge to cure after removal of the forms.

Performance Facts

Many field tests on various curing methods have been conducted. The results prove conclusively that white reflective waterproof paper is best for mix moisture retention and for maintaining lower and more uniform temperatures within the slab. A single layer of Sisalkraft curing paper provides a 17-degree margin of safety in sub-freezing temperatures.

These results subsequently prompted the development of a white plastic-coated curing paper for concrete slab construction. This highly reflective combination comprises two layers of high quality, long fibred kraft having good wet strength properties. The outer surface, coated with white plastic for solar radiation, is laminated to two layers of asphalt having two-way reinforcing fibres imbedded to help resist puncture and tear.

With job speeds and labor rates providing the incentive, radically new curing methods may be developed in the near future. Well and good—if at the same time they contribute to better concrete construction. To adopt a method without first determining its effect on the curing process is pennywise and pound foolish. Quality workmanship and materials are in the spotlight in highway and general construction. In the long run, construction quality is the principal contributor to economy and this is particularly true for concrete pavement.

THE OKLAHOMA state highway department is installing a statewide 2-way 24-hour-a-day radio telephone network. The $600,000 project is being financed jointly by the department and the civil defense.

Road Program

Speakers at ARBA's Atlantic City convention reflect new Washington confidence that the Interstate highway program will get needed financing

"LET'S finish the job on time." This was more than just a keynote at the American Road Builders' Association's annual convention, held March 5-8 at Atlantic City. It was more of a battle cry, as speaker after speaker with Washington status voiced confidence that the Interstate highway program would be put back on the rail at this session of Congress.

Among top-level speakers who emphasized the need for new financing was the new Federal Highway Administrator, Rex Whitton, author of the "finish on time" theme. Whitton along with Congressional committee leaders and others in Washington officialdom, once again helped ARBA perform its historic role of annually bringing into shaper focus the nation's highway needs and how they can be met.

Administrator Whitton in commenting on the financing means outlined by the President, reminded listeners that it's now up to the House Ways and Means Committee and the Senate Finance Committee to find the additional funds. A total of $11.6 billion of new funds must be added to existing financing to insure on-time completion of the 41,000-mile Interstate network by 1972.

Whitton also endorsed the proposal to bring the ABC program up to a $1 billion annual federal support level to keep it in balance.

Another vigorous spokesman for on-schedule completion of the Interstate job was ARBA's executive vice-president, Maj. Gen. Louis W. Prentiss (Ret.). He said that a $5.4 billion annual federal fund flow would be needed for all federal-aid road construction.

Speaking in behalf of ARBA's 7,000 members Gen. Prentiss said "our industry must work toward greater efficiency, and the greatest efficiency tool is cooperation – not just between federal and state agencies but also particularly between these agencies and the commercial segments." Gen. Prentiss foresaw a stepping up of cooperative committee action with the AASHO and the regional highway officials, as a sounding board for new ideas.

ARBA's broad program of industry activities constitutes more than a "voice," said retiring president, Nello L. Teer, in reviewing the association's activities. It has served also as the highway industry's eyes and ears. "But the term 'the voice' has pushed its way into the lexicon . . . more than usual emphasis is being placed on ARBA's role as the industry's spokesman," he said. Factual, unslanted highway information is the association's stock in trade which has made it a respected "source" with congressional leaders, agencies in the executive branch, and of course including the Bureau of Public Roads.

Teer urged industry-wide support to the Better Highways Information Foundation, now in an active program following its founding by ARBA leaders and eventual revamping under the combined support of ARBA, AGC, CIMA and AED.

Factors that are influencing the course of highway development

"Looking Up"

were outlined by A. E. Johnson, executive secretary of the American Association of State Highway Officials. By 1975 the nation's motor vehicles may number 105 million, he warned, with traffic volumes doubled over today.

What may constitute a balanced system of roads now may not hold true for the future, he said. Now 7 out of 10 people are urban dwellers. By 1975, it will be 7 out of 8. Johnson listed such dynamic planning factors as the explosive population gain, the urbanization, and the industrial revolution bringing shifting population, changing transportation costs, intensified research for new products and methods that will in their turn introduce new unknown planning factors.

Johnson also listed under "planning influences" the problem of public opinion. The public has variously been led to believe that highways are being overdesigned, that corruption is rampant in the road program. And they have formed other beliefs which affect the program's financing and execution.

At the first general session Ellis L. Armstrong, president, Better Highways Information Foundation and former U.S. commissioner of public roads, reported on the foundation's progress and outlined the need for a grass-roots educational campaign for highways. Over 600,000 copies of an educational booklet and a flood of other printed aids have gone to the local groups now set up in all states to help this effort.

Bertram D. Tallamy, former federal highway administrator and now a consulting engineer, was honored during the convention by receiving the first ARBA Award for distinguished service to the industry. Nello L. Teer, ARBA president, made the presentation.

"The Industry Talks with Congress" was the climaxing last-day feature of ARBA's Atlantic City program. With B. D. Tallamy, consulting engineer and recently-retired federal highway administrator acting as moderator, congressmen and industry leaders staged a panel review of the highway program outlook. On stage were Dennis Chavez, chairman, Senate public works committee; Francis Case, ranking minority member, Senate public works committee; Jennings Randolph, member, Senate roads subcommittee; George H. Fallon, ranking minority member, House public works committee, and chairman of committee on roads; Gordon Scherer, ranking minority member, House roads subcommittee.

Representing industry were Merle Yontz, president, Le Tourneau-Westinghouse Company; Robert A. McDowell, of McDowell and McDowell, contractors, Nashville, Tenn.; Enoch R. Needles, of Howard, Needles, Tammen & Bergendoff, consulting engineers, New York; and Milton Porter, vice-president, L. B. Foster Company.

Ralph R. Bartelsmeyer New ARBA President

New officers and directors of the American Road Builders' Association, elected at the Atlantic City convention:

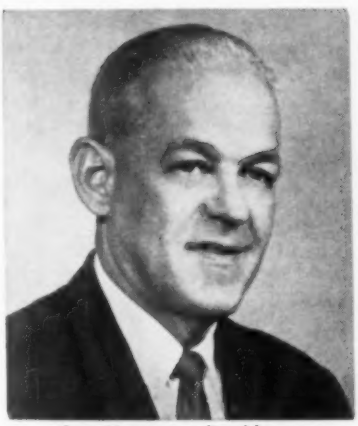
President: Ralph R. Bartelsmeyer, chief highway engineer of Illinois and past-president, American Association of State Highway Officials. He succeeds Nello L. Teer, Jr., of Nello L. Teer Company, contractors, of Durham, North Carolina.

Vice-President: Boyd S. Oberlink, senior vice president, Allis-Chalmers Manufacturing Co., Tractor Division (central district).

Directors (term expiring 1954):

Continued on page 82

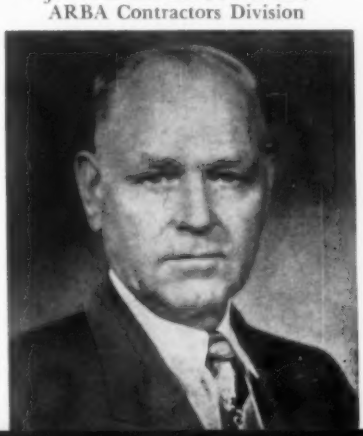
R. R. Bartelsmeyer, ARBA President-elect

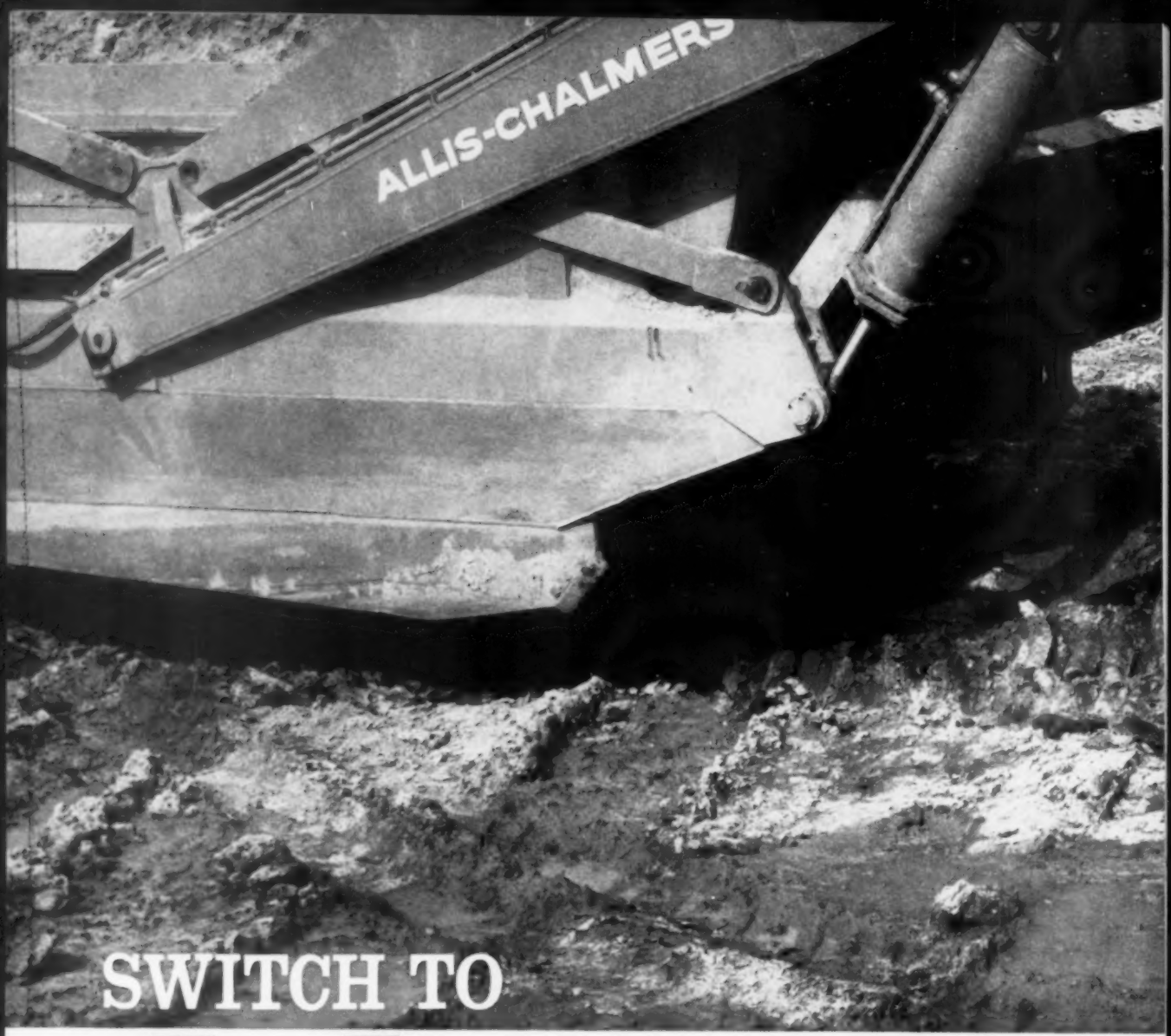


Joe Abramson, President, ARBA County Division

Thomas K. Jordan, President, ARBA Municipal & Airport Div.

James E. Lambert, President, ARBA Contractors Division





SWITCH TO KON-TORK DIFFERENTIAL..

KON-TORK differential provides every Allis-Chalmers motor scraper with maximum traction to match any working condition—provides you with all-weather production.

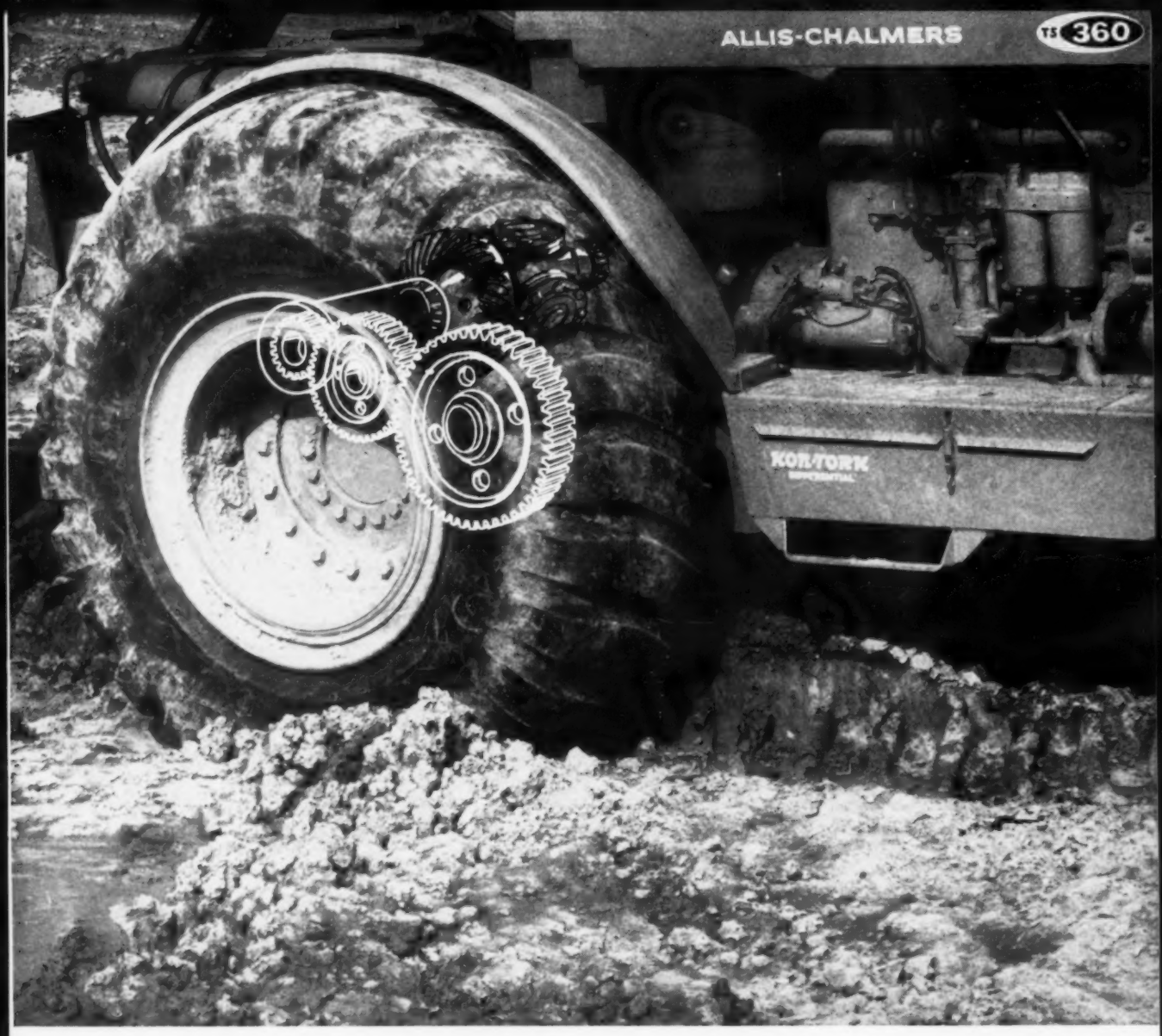
Only Allis-Chalmers offers exclusive KON-TORK differential in every motor scraper. This traction-boosting benefit makes dirt pay under severe job conditions.

KON-TORK works automatically, whenever it's needed. In the cut, on the haul or soft fill, it helps you by automatically controlling the transfer of torque to each drive wheel . . . giving you the benefit of all available traction *all the time.*

Example: When one drive wheel hits soft going, KON-TORK takes hold and transfers torque from the slipping wheel to the wheel with solid footing to keep the machine moving out. Another nice thing

move ahead with

. . . for more details circle 281 on enclosed return postal card



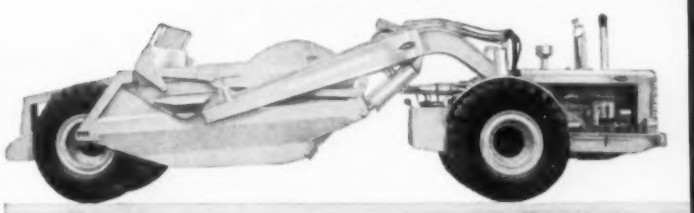
.TRACTION MAGIC, EVEN IN MUD

about KON-TORK . . . it's simple! Only five working parts . . . never needs adjustment!

But this is only one of many features that keep Allis-Chalmers motor scrapers out front on every job. You should see what *full-power steering—double-acting bowl jacks—hydraulic forced ejection and highest apron lift* can do for your production. Try any one of 3 models from 10 to 30 yards. See for yourself. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

KON-TORK is an Allis-Chalmers trademark.

Now available in Persian Orange or Allis-Chalmers Yellow at no extra cost.



ALLIS-CHALMERS

. . . power for a growing world

A tractor gets a braking test on the 300-foot 46 percent slope at Caterpillar's Arizona proving ground. Longer-lasting oil-cooled brakes resulted from this program. →

Desert Survival Tests for Tomorrow's Better Equipment

The scene: thirteen square miles of Arizona desert, "straight out of hell." The time: today and every day. The actors: sun-blackened operators whose job is to test equipment under the worst imaginable conditions. What's it all about? It's Caterpillar's proving grounds for tomorrow's better, tougher and more "survival proof" tractors and earthmoving equipment.

Contractors are interested in this dramatic testing operation because here is where decisions are made on equipment designs that mean better reliability and productivity. Just as GIs during the World War days were "desert marched" to toughen them for the front lines, Cat equipment here really "gets it": grinding runs across boulder-studded washes, jolting and twisting and climbing through swirling dust at 130-degree temperatures.

The objectives as formally spelled out by Caterpillar Tractor Co. engineers are to prove products before their introduction, and to test advanced engineering concepts—all before the machines reach the hands of contractors, and other owners, whose business life depends on them.

Established in 1944, the proving ground near Phoenix spreads over 8,640 acres of desert terrain ranging from flat sand to steep 3,000-foot mountains. The Arizona facilities are linked with the firm's research proving ground facilities and extensive laboratories at Peoria, Illinois.

The Phoenix grounds offer ideal conditions due to the year-around uniformity of climate (7 inches of rain annually). Relatively constant soil conditions permit accurate correlation of test results. Machines can get in 90 hours a week of testing, with time left for servicing and inspection. Testing under such heat and dust often makes possible a year's normal wear in a few weeks, and hence steps up the development refinements that contribute to machine ruggedness.

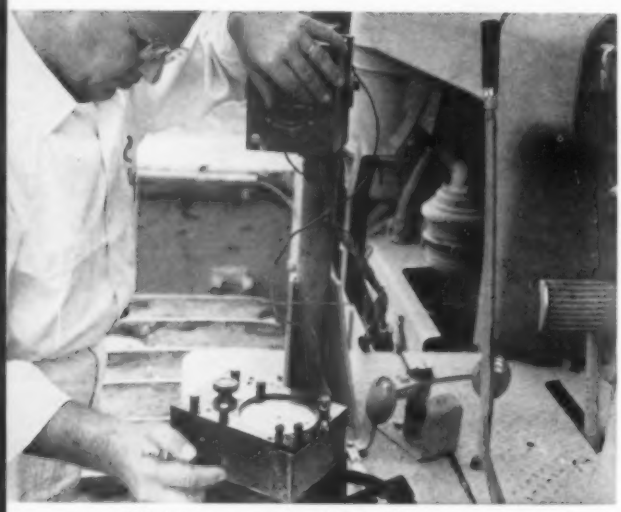
For example, several years ago roller frames on Traxcavators were not holding up as desired in rough going. Heavier frames might solve the problem. Two No. 933 Traxcavators were run side-by-side through boulder fields in Broken Shovel Gulch—one equipped with the standard undercarriage, the other with a new heavy-duty version. In 206 operating hours, the standard undercarriage was reduced to a near "basket case," with almost 100 percent breakage of track links, rollers, idler shafts and supports. But after 775 hours in the gulch, cracks were just starting to appear in the heavy-duty arrangement. Weaknesses which had developed at this point were spotted and corrected. The entire testing program took 16 weeks, instead of two years out on ordinary contractor jobs to obtain similar test results assuring full time work and controlled conditions.

Many other types of tests are in progress here. There is the high-speed level track; the dust track, for heavy rolling resistance and endurance tests; runs through very tough and abrasive caliche, for ripping tests; Rock Road, the most severe test of all; hill tests, up to 46 percent; the Traxcavator pit, with both stockpile and pit-run gravel; the drag circle, for high sustained loads; a tire test track; and other areas for special tests.

How Tests Planned

Testing programs get their start from any of the firm's several Engineering departments, or from the Research groups in Peoria. An outline of the test is made, and the special parts shipped to Arizona. A proving grounds engineer APG engineer is assigned to conduct the test. He then meets with operators and mechanics for a briefing session, explaining what they are to look for, what is already known, and what procedures are to be used. The actual procedures are open to change whenever a better way becomes apparent. When possible, the machine is put on a specific "project," building roads or accomplishing some other task to improve the facilities. This helps make the test more interesting for the operator and maintains realism while the information is being gathered.

Operators working with the test engineers are as important to the success of a test as the finest instru-



Miniature gages buried inside the machine give readings for heating and cooling tests. The engineer plugs his meter into the switch box, then dials the gage he wants to read. Complete readings taken in minutes and the machine sent on its way.

Test tools don't have to be fancy to get results. "Jake's Plow" is a modified dozer on scraper wheels —with ripper shanks, and has been an ideal tool for putting high sustained loads on crawler tractors.

Hard granite knobs on the Rock Road cause such severe strain loads on a tractor that standard parts cannot survive. This standard D7 has been beefed up with reinforcing bars and special fuel tank to withstand high shocks during testing.

ments. Often they can spot a flaw in the machine or the procedure, through performance or "feel," long before it would show up in recorded results. The job-experienced operators used here must fill out daily reports listing details that look good or bad to them. Their reports help engineers design better operator conveniences; better lever locations, shifting sequences, seat adjustments and such.

Many tests are planned primarily to be carefully instrumented and sensitively controlled. The opposite extreme is the Rock Road, a 1.7-mile "torture" course studded with granite boulders sticking 2 to 3 in. above the surface. When a crawler tractor crashes across these knobs at top speed, shock is so great that it is impossible to test anything but certain track components. Ordinary fuel tanks give up in a day; they are replaced with special tanks of ¾ in. plate. All frames must be reinforced to double strength. And still they break.

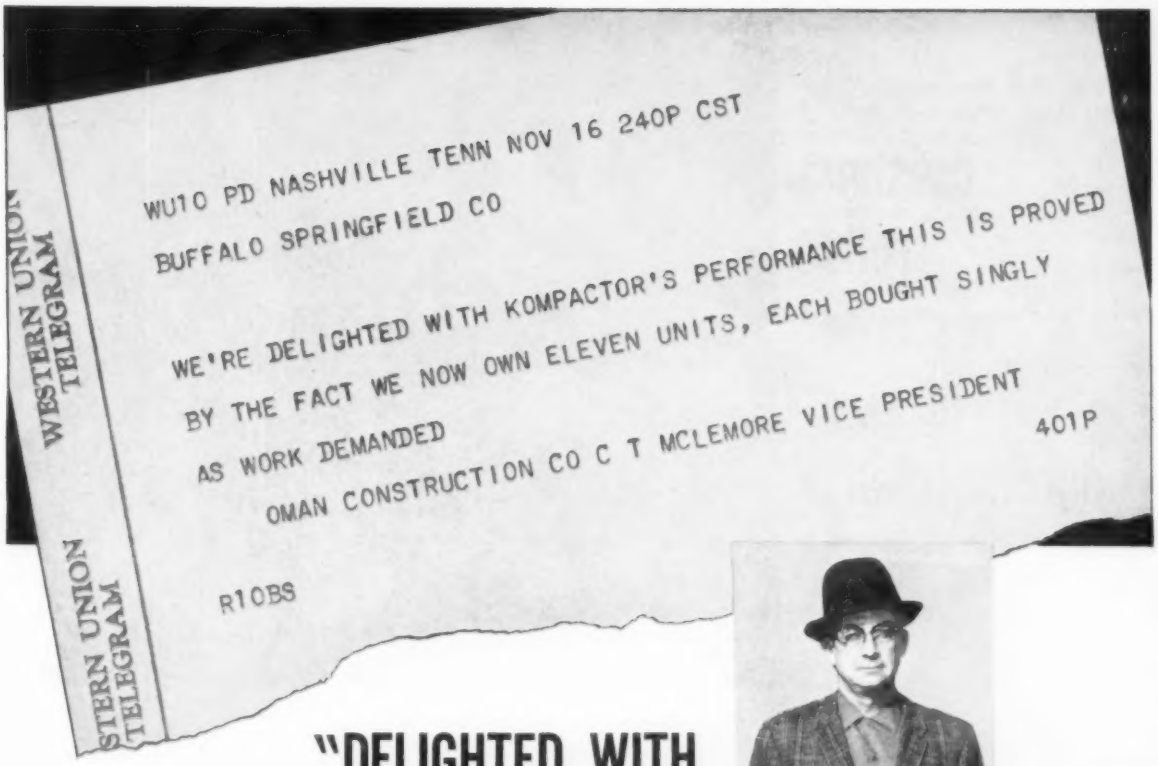
This body-racking test rumbles on day and night. Less than ten years ago rollers were destroyed in 100 hours on this road. New ideas in seals, shafts, housings, flanges and bearings were pounded to death during the succeeding years. But the testing is paying off. Rollers, for example, have been beefed up and otherwise strengthened. Thus, when Caterpillar recently introduced lubrication with seals lasting the life of the roller, the shock tests contributed to the total development of an improved hard-usage part.

An entirely different kind of test is that done to study heating and cooling on production machines, roaded at high speeds. The engineer checks temperatures in lubricant and coolant compartments through a network of miniature gages strategically located throughout the machine. Similar tests can be run for intermittent loading by putting the machine on pioneering work, such as opening up a new section of the rugged mountains, for for constant high load with a Jake's Plow, a dozer blade mounted backwards and equipped with ripper teeth.

Like in almost every other field, the men at APC are finding that their work is becoming more technical and elaborate. In its early days, much of the research was elementary—run it till it breaks, put a thermometer in the coolant to see if it is overheating, pile on more weight to see how much it will pull. Sometimes this is still the best way to learn what is needed. But today precise gages are affixed to or buried inside the machines, telling when things are about to happen. Engineers can tell exactly what is wrong or weak, unhampered by secondary damage caused by the prime failure. Reactions are studied to the smallest part of an inch, to the hundredth of a second.

Design engineers believed they had found a much improved brake shoe material, good for triple service life without fade as compared to the then-production version. Test shoes were shipped to Arizona and put on a D8. Comparative runs were made with this D8 and one with standard shoes, on 300-ft. of 46 percent grade. A new super brake finally emerged from this program—the oil-cooled brake for the D8, using oil in the steering clutch compartment to absorb friction and carry off heat. Dry linings lost most of their holding ability in three fast stops on the steep grade, and were worn out in about 30 hours (2,100 applications). The

Continued on page 79


WESTERN UNION TELEGRAM
WU1O PD NASHVILLE TENN NOV 16 240P CST
BUFFALO SPRINGFIELD CO
WE'RE DELIGHTED WITH KOMPACTOR'S PERFORMANCE THIS IS PROVED
BY THE FACT WE NOW OWN ELEVEN UNITS, EACH BOUGHT SINGLY
AS WORK DEMANDED
OMAN CONSTRUCTION CO C T MCLEMORE VICE PRESIDENT
401P
R1OBS
STERN UNION TELEGRAM

"DELIGHTED WITH KOMPACTOR® PERFORMANCE... *OWN ELEVEN"*

says C. T. McLEMORE, Vice President, Oman Construction Co.

Many cost-conscious contractors, like Oman Construction Co. have found Kompactor the practical answer to meeting density requirements. It's self-propelled, operates on an interrupted pressure principle that delivers the compaction you need in less time and with fewer passes. You get more uniform density. There's no displacement of materials due to "bulldozing" ahead of the wheels. And with Kompactor, you can wheel in tight to culverts, walls, and abutments — eliminate a lot of costly hand tamping work. Cost of compaction with Kompactor: About two cents per yard. See your distributor.

Road-to-Basement — *Oman Kompactors on highway job, and compacting fill in building basement show extreme versatility of machine. Each pad segment exerts pressure of 580 lbs. per lineal inch for total length of pad.*

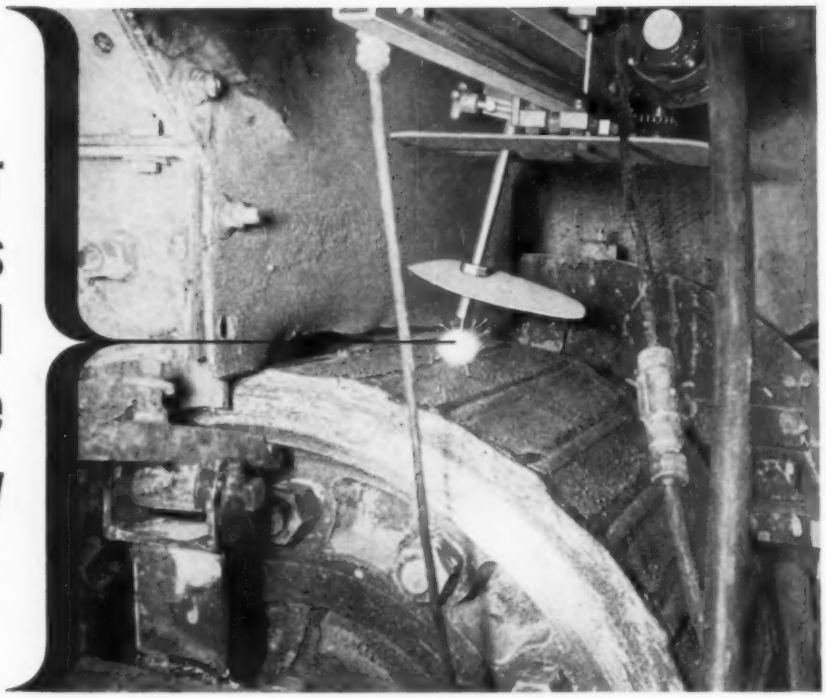
BUFFALO-SPRINGFIELD COMPANY
Springfield, Ohio

A Division of **OEHRING** *Company*

B103

. . . for more details circle 329 on enclosed return postal card

crusher rolls restored to size automatically



with STOODY CRUSHERMATIC

Now you can rebuild your crusher rolls to size and hard-face them automatically *in position!* The STOODY CRUSHERMATIC, a Stoody portable automatic welding system, temporarily suspends over the crusher rolls; can be used with your regular semi-automatic wire feeding unit and a power supply of adequate capacity.

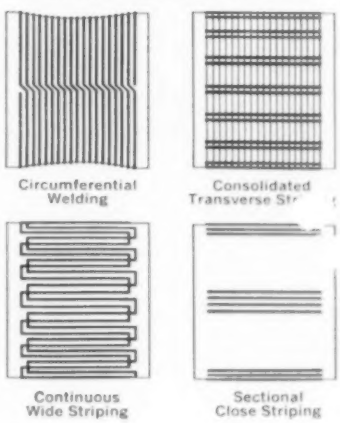
Cuts Maintenance Overhead 50%

Because welding is continuous, maintenance costs are drastically reduced. Crushermatic actually deposits up to 20 lbs per hour on continuous duty... 300% faster than manual welding and 200% faster than hand-held semi-automatic welding!

Easy on the Weldor

Crushermatic takes the work out of welding—takes the weldor out of the crusher! All necessary controls are *outside;* the weldor works in clean smoke-free air, in comfort.

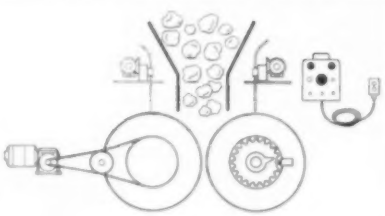
VERSATILE WELDING PATTERNS



Electronic controls in the Crushermatic unit permit a wide variety of welding patterns, producing virtually any desired bead spacing. The illustrations show typical possibilities.

SIMPLE INSTALLATION

Permanent brackets are welded in the crusher supporting the CRUSHERMATIC unit in proper position over the rolls. In some cases it is necessary to cut an entry door through the crusher chassis and to fabricate a removable access cover in the screening hopper to expose the roll.



See live demonstration of these machines—
STOODY Booth #424—AWS show, April 18-20, 1961
Coliseum, New York City.

STOODY COMPANY
11908 East Slauson Avenue
Whittier, California

. . . for more details circle 348 on enclosed return postal card

new oil-cooled brakes did not fade, required only nine adjustments in 109 hours of this application, and then were used for another 109 hours on a somewhat less severe test, and were still in usable condition.

Dust, Engine Nemesis

Engine dust protection is another research subject here. Dust, of course, is the nemesis of diesel engines, gear trains and incidentally, operators. Runs on the APG dust track stir the powdery soil until the operator can't see his control levers. Out of this testing has come the new dry-type air cleaner. Working on one of the many tests conducted with component manufacturers, Caterpillar engineers were looking for a better cleaner than the oil bath. Various designs were tried. In one particular test, the tractor was run until it could barely pull in low gear. At this point the engine became a pump, just shoving raw fuel up the stack. Not enough air passed through the cleaner to let the fuel burn.

At first, when this happened, the operator headed for the shop where engineers could look inside the cleaner to see what was happening. But they got strange results. As soon as the tractor had returned to the shop area, the smoke cleared up and the engine picked up new life. So the operator slipped it into a higher gear and stormed through the dust again, grinding away until the cleaner clogged. After a few times they realized that the vibrations caused by the track on hardened ground was jarring the dust off the filter element, allowing the air to pass through again. So the next time the engine was starved out, the operator stopped where he was and let the engineer come to him. The outcome of the entire program was the new dry-type air cleaner, capable of filtering out 99.8 percent of all dirt, and not letting dust pass on to the engine even when the cleaner is loaded.

The testing still goes on at Caterpillar's Arizona proving grounds. Sometimes new ideas are shown up as nothing more than a pipe dream. Often they emerge as sound concepts. It's part of the industry's continued evolution of proven machines, capable of maintaining near-constant cost-per-yard productivity despite other rising costs.

Flying Machinery Salesman

With the helicopter parked on the "landing strip" in back of the used machinery lot in Birmingham, Wyatt Owens (left) and H. J. Leary, of Leary & Owens Machinery Co., Inc., go over Casey's list of customer calls before take-off.

Flying salesman A. F. Casey brought the helicopter in low over a highway grading job in northern Alabama. Soon on the ground, he hung up his earphones, grabbed his brief case, flipped open the plexi-glass door and stepped out alongside the scrapers working on this segment of State Highway 78 northwest of Birmingham.

Simpson Faulkner, superintendent for Harbert Construction Corp., came over to meet him. Casey began discussing equipment needs and the progress of the job, which involved moving about 2.8 million cubic yards of rock, clay and sand.

Just an hour earlier, Casey had finished his breakfast at his home in Guntersville, 70 highway miles north. This was starting as a normal working day. Casey had walked out the back door, "cranked up" his Brantly Model B-2, and taken off for the first of his usual dozen calls per day. His "landing strip," the cleared highway right-of-way, was typical of those he used every day in making the rounds for Leary and Owens Machinery Co., Inc., of Birmingham.

Faulkner and Casey went over the specifications and plans for the 6.7-mile segment of the new highway. The two discussed areas where a great deal of rock was being en-

Simpson Faulkner, job superintendent for Harbert Construction Corp., waves to his excavation foreman and flying-salesman Casey as they hover over the job.

Casey and W. C. West, Jr., foreman for Watkins Construction Co., go over plans for $1,385,000 project on Interstate 59 near Gadsden, Alabama.

countered, then turned attention to the work which loomed for the Allis-Chalmers TS-360 motor scrapers just purchased for the job. Two TS-360s were already busy.

After flying one of the foremen over the job, Casey climbed aboard again and headed out 120 miles northwest to visit another customer. Not long after that, his visits cut short by threatening weather, he was back at his company's two-acre landing plot in Birmingham's industrial section. Soon he was in conference with H. J. Leary and Wyatt Owens, partners in the Allis-Chalmers dealership, going over his trip reports with the sales manager.

Another day, he visited the 900,000 cu. yd. grading job of Watkins Construction Co. project on Interstate Highway 59 southwest of Gadsden, where TS-260 motor scrapers were found performing satisfactorily.

A convenient way to get around? All in the day's work of this representative who has found this new way to cover his 11-county territory and keep in quicker contact with his firm's contractor customers and their fast-changing problems and job requirements.

REX® headquarters for everything in concrete road paving

ALSO REX

- ✓ Bridge Finishers
- ✓ Central-Mix Plants
- ✓ Subgrade Planers and Testers
- ✓ Road and Airport Forms

SEE YOUR REX DISTRIBUTOR now or write for your file of bulletins on the complete Rex Road Paving Line. CHAIN Belt Company, 4652 W. Greenfield Ave., Milwaukee 1, Wisconsin. In Canada: Rex Chainbelt (Canada) Ltd., Toronto and Montreal. Distributors in All Principal Cities of the World.

REX®
CONSTRUCTION MACHINERY

. . . for more details circle 298 on enclosed return postal card

ROAD PROGRAM LOOKING UP *Continued from page 71*

Levi Bird Duff, director Allegheny County Board of Works, Pittsburgh, Pa.; E. H. Holt, vice-president, Barber-Greene Company, Aurora, Ill.; Emmett H. Karrer, professor of civil engineering, Ohio State University, Columbus, Ohio; Walter Reed, president, Walter Reed Corporation, Boston, Mass.; W. A. Van Praag, Bendix Computer Div., Electro-Log Corp., Los Angeles, Calif.; and Paul Wright, Jr., president, Durham Bank & Trust Co., Durham, N. C.

Also elected were presidents of various ARBA divisions for 1961:

Contractors Div.: James E. Lambert, president, Lambert Construction Co., White River Junction, Vt.

County Div.: Joe Abramson, engineer, Caddo Parish, Sheveport, La.

Educational Div.: Ellis Danner, professor of highway engineering, University of Illinois, Urbana, Ill.

Engineering Div.: Maurice N. Quade, partner, Parsons, Brinckerhoff, Quade & Douglas, New York, N.Y.

Materials & Services Div.: S. J. Duncan, manager, highway sales, International Salt Company.

Municipal & Airport Div.: Thomas K. Jordan, director, Wisconsin State Aeronautics Board, Madison, Wis.

Lichtinger Heads CIMA

Also elected at Atlantic City were 1961 officers and directors of the Construction Industry Manufacturers Association. These are:

President: A. J. Lichtinger, executive vice-president, Wellman Engineering Co., Cleveland, Ohio. He succeeds Donald V. Buttenheim, Buttenheim Publishing Co., New York.

Vice-Presidents: (1st) Buell M. Wallis, vice-president and marketing director, Schield Bantam Co., Waverly, Iowa; (2nd) Robert E. Hunter, general sales manager, Detroit Diesel Engine Div., General Motors Corporation, Detroit, Mich.

Treasurer: Ray McLean, president, Jaeger Machine Co., Columbus, Ohio.

Secretary: R. R. McKenrick, executive director of CIMA, 135 N. LaSalle St., Chicago, Ill.

'Know Your Equipment' Symposium ARBA Convention Feature

Equipment was "king for a day" at Atlantic City, as delegates at the American Road Builders' Association's 59th annual convention thronged to a panel discussion on equipment and material development and use.

Chairman of the ambitious 27-man panel meeting was Donald V. Buttenheim, president of Construction Industry Manufacturers Association, with the moderator spot handled by H. A. Radzikowski, chief, division of development, Bureau of Public Roads. The all-morning program took the form of highlight reviews of the various extensive papers, followed by question-and-answer periods.

The topics encompassed earthmoving, material processing, on-site paving work, and acceptance of new equipment developments.

In launching the meeting chairman Buttenheim observed that the purpose was to "explore the premise that modern equipment is the key to building today's roads—economically, efficiently and expeditiously—and to heighten our resolve to remove any road blocks that now hamper us from integrating the best equipment into the highway program."

The aims of the session were to demonstrate that modern equipment, coupled with the contractor's ingenuity, has made a great contribution to road building productivity and quality control; to focus on the capabilities of the new equipment and the need for prompt adoption of specifications that will permit its use; to spotlight significant trends; and to emphasize the economy of replacing outmoded equipment with new and more efficient types.

Moderator Radzikowski cited the magnitude of the factory research effort going on today toward constantly better machines. As one example, he told of an equipment maker who recently ran 170,000 complete 60-second mixing cycles to check the accuracy of a plant timing device. The problem everywhere, he said, is to know enough about equipment—to be able to exploit more fully the advantages of design performance made available by the manufacturer. This problem concerns everybody—not just the contractor but also often the highway administrator, designer, specification writer, and maintenance official.

Over 350,000 construction equipment units and motor vehicles are today in the hands of the nation's 11,000 contractors and their innumerable subcontractors, said Radzikowski. This total fleet valued at $4 billion could perform $8 billion in annual on-site production. Another $2 billion in equipment totaling 400,000 units comprise the maintenance fleet on roads and streets.

Rapid revamping of equipment fleets is in prospect, as new models become available and old units wear out, said the moderator. This replacement will be stepped up as the highway program is brought back on schedule.

Earthmoving took up more than half of the morning session, with W. K. Cox, vice-president of Caterpillar Tractor Co., refereeing

this part of the panel. He said that the graded roadbed or embankment is undoubtedly one of the best buys the American taxpayer is getting for his highway construction dollar. The heavily graded roadbed costs only about one-fourth of the total facility, noted Cox. This favorable situation is due to two factors: the wealth of earthmoving equipment for every conceivable type of excavation, and continuous improvement of earthmoving equipment which has kept unit dirt costs about level over the past three decades.

The stability of earthmoving costs, Cox observed, has had a great effect on highway design. Because unit grading costs are so low, the designer has been encouraged to develop today's advanced highway with its easy grades and curves, flat roadside slopes and other features which aid traffic and save maintenance. Earth and rock grading reached 20 million cubic yards daily on the nation's highways in 1960.

Earthmoving leader Cox highlighted papers from panelmen which included H. T. Larmore, of Allis-Chalmers Manufacturing Company; Robert Warren, Clark Equipment Co.; E. O. Martinson, Koehring Co.; Warren Thompson, International Harvester Co.; J. C. Sheets (for W. C. Hendricks), LeTourneau-Westinghouse Co., G. E. Danby, Euclid Road Machinery Division, General Motors Corporation: Charles T. Thompson, Joy Manufacturing Co.; John Walker (for Kenneth L. Fitts), Mack Trucks, Inc.; R. P. Shea, Preco, Inc.; William O. Troyer, Galion Iron Works; and Ralph R. Bartelsmeyer, chief highway engineer of Illinois.

Following are some of the points of interest which Cox extracted from the panelists' papers:

Diesel engines since their introduction in the earthmoving field in 1931 have been revolutionized with today's engine offering far greater power-to-weight ratio and such refinements as the turbo-charger, after cooler.

Diesel engines now have dry type air cleaners instead of oil bath cleaners, 99.8 percent efficient in their protection of diesel engines against dust.

Power trains on tractors have seen great strides, bringing further efficiency gains, with performance aids coming from such refinements as oil brakes and clutches which eliminate four-fifths of former adjustment attention, easily removable engines and transmissions, and undercarriages that go 2,000 to 3,000 hours between greasings.

The heavy tractor today has twice the power of its wartime predecessor; hydraulic rippers have made many jobs rippable that formerly required drilling and shooting; the seismographic method of subsurface exploration now helps contractors plan their jobs with greater certainty.

Earthmoving as a result of these and other refinements is speeded up with much equipment moving at twice the former speed, aided by better tires. Dozers are designed with a choice of improved blade configurations. Scraper work, too, is undergong rapid evolution, aided by such procedures as tandem push loading with cushioned pushblocks. Motor graders are "going automatic" with the help of new electric blade controls. New high-strength steels today are cutting the dead weight of equipment.

One manufacturer alone is spending $100 million in research and development toward better machines.

Cox in concluding this quick perspective on earthmoving equipment advances quoted Bartelsmeyer, Illinois chief engineer, as urging greater standardization of state grading specifications and more use of the end-result principle in spelling out the contractor's end of the highway job.

"Meanwhile," Cox concluded, "we in the manufacturing end are continuing to do what we can to see if there isn't a 'better way to do it'."

The discussion period that followed Mr. Cox's resume of the earthmoving papers brought up a good many questions, with some of the topics covered only in a fragmentary manner. One subject in particular, rolling procedures, brought out several noteworthy points:

1. Proof rolling, or test rolling with a heavy compactor to determine if any weak spots remain in a subgrade or base layer, can be only an aid to the inspector, said Bartelsmeyer of Illinois. Tire pressures and total roller weight must be controlled in relation to the kind of soil, and test rolling must follow carefully devised rules.

2. Tire pressure is one of several aspects of pneumatic roller operation that need a fresh analytical approach, another panelist said. Contact area, roller speed, oscillation of wheels, temperature (in asphalt), and other elements are still left to individual judgment or are governed by empirical rules. Pneumatic rolling when done most efficiently can often reduce roller passes to less than half the number formerly employed, offering important job savings.

Other topics aired briefly in the earthmoving panel included automatic levelers on motor graders, use of rippers, dealer relationship in helping estimate jobs, present role of crawler-tractor-drawn scrapers, rubber-tired dozer advantages, new developments in land clearing methods, tandem scraper operation, diesel engine evolution, and heavy crawler-mounted rock drills.

The proceedings of the equipment meeting, including earthmoving, material processing, paving, and acceptance of new equipment, will eventually be made available to the industry, according to an ARBA spokesman.

AASHO Test Road Data

The New York State Thruway Authority today retained a private consulting engineering firm, headed by former Federal Highway Administrator Bertram D. Tallamy, to develop a long-range heavy maintenance program extending through 1975.

Authority chairman R. Burdell Bixby announced that Mr. Tallamy would among other assignments evaluate, for possible application to the Thruway, the scientific data developed by the AASHO Road Test project. This information will be available following the current period of evaluation.

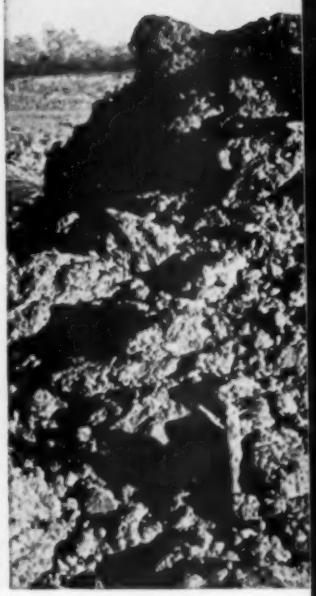
Under the new consultant's agreement, Bixby noted, the Thruway will be the first highway facility planning to conduct a highway maintenance and operating study based on this test project.

Mr. Tallamy was the first chairman of the Thruway Authority when the agency was created in 1950. He also served as New York State Superintendent of Public Works from 1948 to 1954.

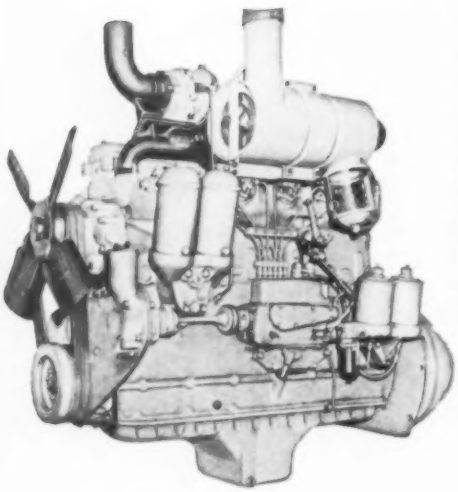
New 140-hp International TD-20 crawler

NEW International® TD—

...built to "BEEF UP" your profit edge!

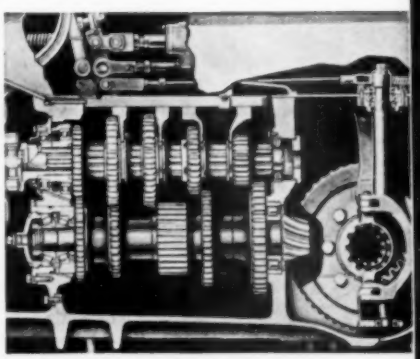


From air intake to new fixed drawbar—from day-to-day dependability through year-in, year-out durability—new strength, new performance protection, new work capacity are built into the new TD-20. Check and compare the advantages of International turbocharged Diesel power, teamed with beefed-to-match new transmission and final drive components—platformed on a far stronger-than-ever undercarriage—turned into new efficiency by International-built tracks, kept in life-prolonging alignment by exclusive International 3-point suspension. See your International Construction Equipment Distributor for a new TD-20 demonstration.



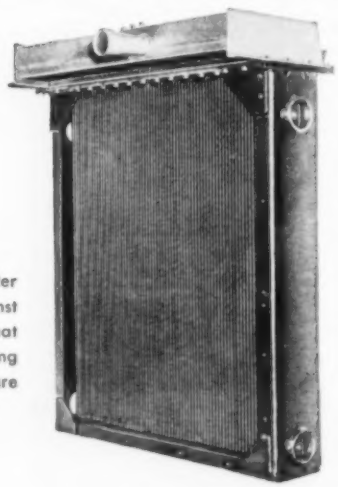
New Turbocharged Diesel Wallop

Modern turbocharging crams air into the new TD-20's smooth running 6-cylinder engine—to produce extra hp efficiently at all altitudes; and to give a 50% torque rise to lug larger overloads. Crankcase ribs are "beefed up;" cooling, air cleaning, and crankshaft capacity all are increased to team with turbocharging. Push-button TD-20 starting is by famous International gasoline-conversion system!



New transmission capacity ...New filtering system added

Heavier shafts, more rugged gears, and roller bearings of greater capacity are provided—to carry increased hp and add thousands of hours to working life of power train components. New transmission oil pump circulates and filters life-guarding lubricant. New "short-travel" levers add operating ease.



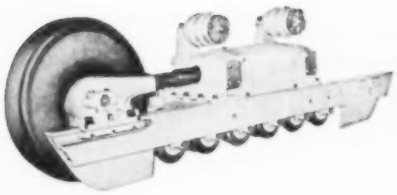
Larger radiator plus jet head increases cooling capacity

Coolant, under pressure from the new greater capacity radiator, is shot through jets against lower surface of TD-20 heads—to aid heat transfer and avoid build-up of heat-trapping deposits. Fan shroud and radiator guard are "heavied" for increased rigidity.

-20

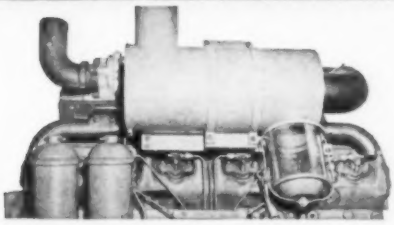
(201 SERIES)

New 140-hp International TD-20 crawler tractor. Develops 113 drawbar hp. Powered by 6-cylinder DT-691 Turbocharged Diesel engine. New capacity 6-speed, full-reverse transmission is controlled by new short-travel gear-shift and Shuttle-Bar levers.



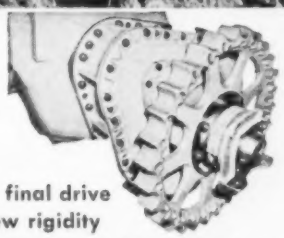
New Undercarriage Strength and Protection

New drum-type front idlers add strength... International also adds track chain guides to both sides of the TD-20's precision-welded double box-beam track frames! New track roller shields are of cast steel. New heavier strutless track links are self-cleaning and power-saving. The new hydraulic track adjuster, with built-in safety relief is "standard" on the new TD-20. And full-floating seals of increased efficiency guard Dura-Roller life!



New 99.8% efficient Dry-Type air cleaner

For positive "breathing" safety, the full air volume taken in by turbocharging is "dry-cleaned" of 99.8% of its dirt—by the TD-20 Diesel's new dry-type air cleaner. Handy, under-hood horizontal mounting—and transparent, quick-dump collector—greatly simplify servicing. Dash indicator shows "red" when cleaner element needs washing.



New final drive ...new rigidity

New TD-20 final drives have been strengthened to deliver full torque turbocharged power to the tracks. New sprocket drive doweling increases housing rigidity—helps maintain precision component alignment. Other major steps ahead in TD-20 design include: new torque-taking, life-adding bimetallic steering clutch discs; new pivot shaft inner spacer; new hardness of sprocket drive pinion shaft.

International® Construction Equipment

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

. . . for more details circle 321 on enclosed return postal card

Memo to Highway Engineers:

Re: AASHO Road Test

REQUEST FROM AMERICAN ASSOCIATION
OF STATE HIGHWAY OFFICIALS

Officers of the American Association of State Highway Officials (AASHO), the sponsor of the Road Test research project at Ottawa, Illinois, have expressed their hope that neither the Asphalt nor the portland cement industry will draw conclusions from the project ahead of the completion of the analysis of data and the interpretation of such data into final reports.

AASHO officers state that they do not believe any conclusions can properly be drawn at this time.

Moreover, these officers charge that any action to read premature findings from the project tends to reduce the public benefits from the expenditure of rather large amounts of public funds which went into the test.

Specifically, these AASHO officers have requested that AASHO's name not be used in any advertisements purporting to give results of the Road Test ahead of final reports because such use might convey the impression to the public that AASHO endorses the advertising.

This request from AASHO officers was directed to the portland cement and Asphalt industries on March 1, 1961.

THE INTENT OF THE AASHO ROAD TEST

The Official Statement of the Highway Research Board*
which Administers and Directs the Test:

The AASHO Road Test plays a role in the total engineering and economic process of providing highways for the nation. It is important that this role be understood.

The Road Test is composed of separate major experiments, one relating to asphalt concrete pavement, one relating to portland cement concrete pavement, and one to short span bridges. There are numerous secondary experiments. In each of the major experiments, the objective is to relate design to performance under controlled loading conditions.

In the asphalt concrete and portland cement concrete experiments some of the pavement test sections are underdesigned and others overdesigned. Each experiment requires separate analysis. Eventually the collection and analysis of additional engineering and economic data for a local environment are necessary in order to develop final and meaningful relations between pavement types.

All of the short span bridges are underdesigned. Each is a separate case study.

Failure and distress of the pavement test sections and the beams of the short span bridges is important to the success of each of the experiments.

The Highway Research Board of the National Academy of Sciences--National Research Council has the responsibility of administering the project for the sponsor, the American Association of State Highway Officials, within the bounds of the objectives of the test. The Board is also responsible for collecting engineering data, developing methods of analysis and presentation of data, drawing valid findings and conclusions, and preparing comprehensive reports describing the tests and the results. It is here that the role of the AASHO Road Test ends.

As the total engineering and economic process of providing highways for the nation is developed, engineering data from the AASHO Road Test and engineering and economic data from many other sources will flow to the sponsor and its member departments. It is here that studies will be made and final conclusions drawn that will be helpful to the executive and legislative branches of our several levels of government and to the highway administrator and engineer.

*Highway Research Board is a unit of the
National Academy of Sciences--National Research Council.

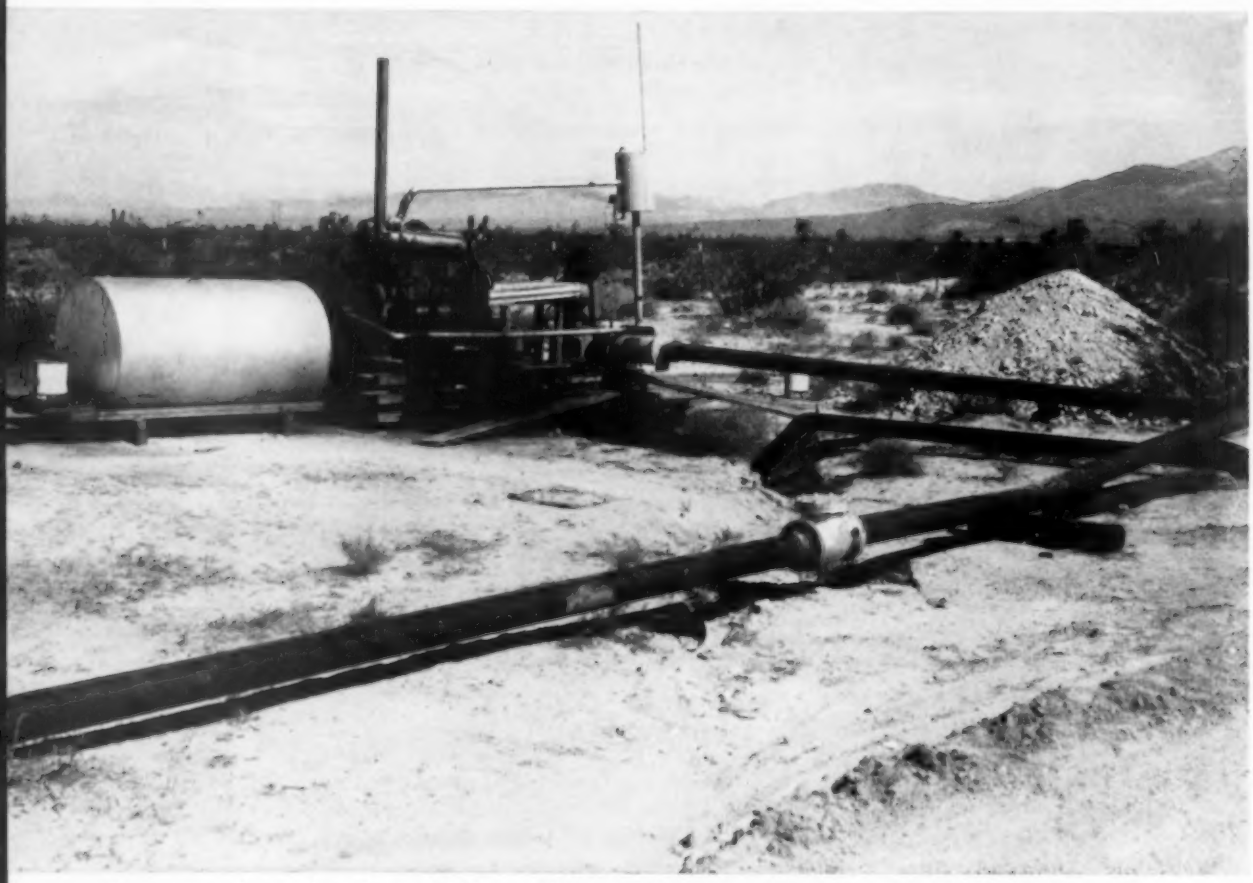
THE ASPHALT INSTITUTE

--has not sponsored, and is not sponsoring, any advertisements about results of the AASHO Road Test.

Further, The Asphalt Institute agrees with the propriety of the above request from AASHO officials. Also, The Asphalt Institute subscribes to the above statement of the INTENT of the AASHO Road Test.

J. E. Buchanan

J. E. Buchanan
President
The Asphalt Institute



Booster pumping station along roadside waterline—needed to lift water over a summit and into Reservoir No. 2.

One of six 10,000-gal. water stations strung along the job. Note big (12 in.) "faucet" for speedy loading of big sprinkler.

Dirt collector box mounted on riser from pipeline into dispensing tank. Six-inch threaded cap permits quick inspection and removal of accumulated debris that clog the line.

DESERT FREEWAY JOB *Continued from page 58*

2 filled to 400,000 gal. capacity. From here, for 13 miles to the southern end near Baker, gravity did it.

Soaking of various of the six principal borrow pits was done by junctioning off with 3-in. aluminum pipe fitted with Rainbird sprinkler heads.

Water for maintaining moisture during compaction, and for wetting haul roads, was dispensed from six portable 10,000 gal. tanks, steel frame mounted for speedy gravity filling of sprinkler trucks. More thought than meets the eye went into the design of these tanks. Each had a 12-in. outlet pipe for 6-minute refilling of a 5,000-gal. tanker.

The intake was located at the top of the tank, to cut down on the effect of too much gravity head. The tanks in some locations actually were supplied under a head of 1000 ft., with pressures difficult to manage at best. By pulling water down through the tank, several feet of head was absorbed in a surge-chamber effect.

Another important detail: the riser from the pipeline was fitted with a dirt collecting box (see photo). These boxes collected such items as steel shavings left from the pipe manufacturer. The dirt trap paid off in preventing clogged lines.

As to the sprinkler rigs, they were typical of those seen on western projects. Two were 8,000-gal. Southwest off-road type semi-trailers, Cat DW20 tractor-drawn. Others were truck-mounted 3,000-gal. units, with tandem rear axles and dual rear tires.

The pipeline and tank deployment was carried progressively south, with just enough pipe in use at any time to take care of current operations. The wayside tanks were relocated ahead as needed, but the lag in base construction often made it necessary to keep sprinklers working at scattered locations several miles apart. Water demand often ran to 300,000 to 400,000 gal. per day, and some planning was necessary to permit soaking of borrow pits during hours when the demand was lowest for compaction water and haulway sprinkling.

Darel Doyle is project manager for Gordon H. Ball and associated companies on the California I-15 job, with Vincent Smith general manager. The project is part of the program of the San Bernardino District, California Division of Highways, with J. O. Erwin, resident.

Army Engineers Test Automatic Mapping Unit

A new type automatic mapping instrument, designed to reduce the time required to contour aerial photographs, is under test by the U.S. Army Engineer Geodesy, Intelligence and Mapping Research and Development Agency, Fort Belvoir, Virginia. The "Stereomat" so-called, provides automation of the time-consuming task of establishing contours for maps made from aerial photography.

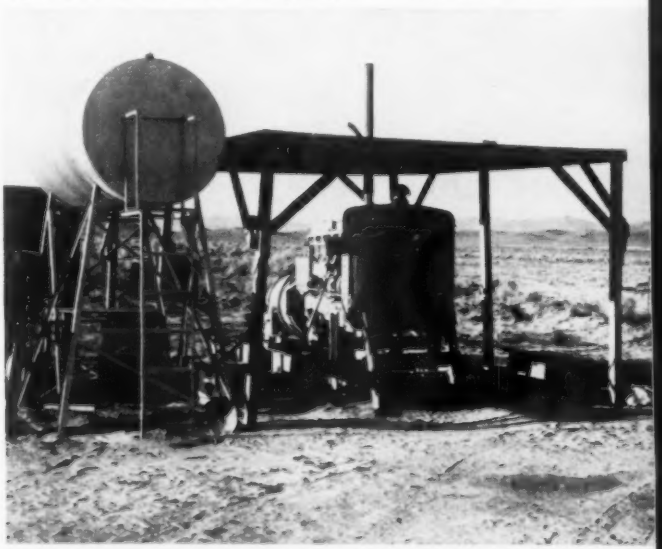
The machine employs photoelectric cell "flying spot" random scanning and other electronic techniques, thereby permitting faster processing of data.

Present map-making techniques, using manually operated photogrammetric plotting machines, permit reconstruction of the surface geometry of the ground from stereoscopic pairs of air photos. Highly trained operators with present machines can determine differences in ground elevations between all points as well as the distance between the points. This is a slow, delicate and fatiguing process, far outstripped by the air photo taking.

The Stereomat is a development of Hunting Associates, for which Benson-Lehner Corporation is manufacturing licensee.

One of several submersible electric well pumps for Reservoir No. 1 water supply.

At Reservoir No. 1—Cat diesel-electric generator for powering several submersible well pumps at Reservoir No. 1.



B.F.GOODRICH TIRES MOVE ROCK FILL FOR COUGAR DAM.

Finished dam will tower 485 feet, stretch 1,600 feet, and slope from a base width of 1,500 feet to a crest width of 40 feet.

Six-mile reservoir will provide water resources for flood control, power production and public recreation. $50-million project is scheduled to take four years.

30 TONS OF ROCK CRASH onto B.F.Goodrich Rock Service tires. Tires work two shifts a day on scrapers, bottom dumps, rear dumps, water wagons, graders, rollers and mobile cranes. Yet it's not unusual for tires to be retreaded twice.

CONTINUOUS TIRE INSPECTIONS play a key role in keeping M-C&S' equipment on the go. The B.F.Goodrich Unified Contractors Program helps contractors save on all their rubber products—and protective clothing—requirements. Ask your BFG dealer to show you how this new program can help *you*.

B.F.Goodrich helps move a mountain to build a dam

B.F.GOODRICH ON-THE-SPOT SERVICE helps M-C&S get the most out of equipment. Tire changes seldom take longer than 15 minutes. BFG Servicemobiles carry all the latest power tools, are manned by tire experts.

12-MILLION CUBIC YARDS OF ROCK AND EARTH FILL RIDE TO $50-MILLION COUGAR DAM PROJECT ON B.F.GOODRICH TIRES

They're changing the topography of Oregon's Willamette Valley. Rock quarried from a knob high above the South Fork McKenzie River is taxied down a tortuous road by a fleet of giant earth movers. It will become part of the fill for Cougar Dam, a Corps of Engineers flood control project that will be the largest structure of its type in the Northwest.

Altogether, general contractor Merritt-Chapman & Scott Corp. will move 12-million cubic yards—every one on B.F.Goodrich tires. You'll find B.F.Goodrich Rock Service tires with Cut Protected compound hard at work here. BFG developed this compound for jobs like Cougar Dam, where upwards of 30-ton loads must be carried over hard, rock-surfaced roads. It takes a mighty big boulder to gash this compound, and if it should, there's BFG Flex-Rite Nylon cord construction to withstand the impact (and resist heat blowouts and flex breaks too). No wonder many Rock Service tires at Cougar Dam can be retreaded twice.

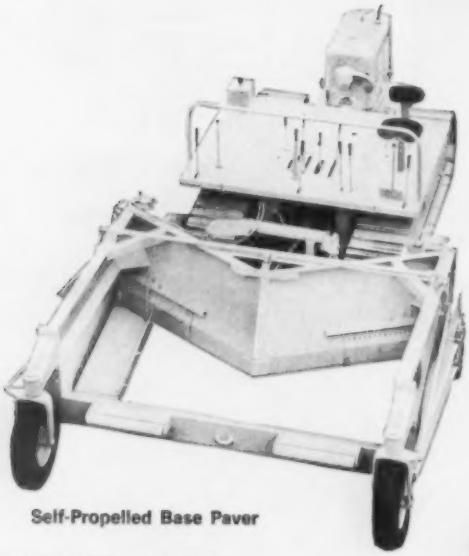
B.F.Goodrich on-the-job service plays a key role in keeping M-C&S equipment on the go. All 600 BFG tires are inspected regularly. Tire changes seldom take longer than 15 minutes. There is a BFG tire warehouse and shop less than a mile from the project. A BFG tire record system keeps the contractor informed of costs and helps control inventory.

Supplying contractors with longer-wearing tires and dollar-saving service is an everyday job for B.F.Goodrich. On many projects B.F.Goodrich supplies everything from tires to boots to belts through its new Unified Contractors Program. Whatever *your* need, it will pay you to talk to your B.F.Goodrich dealer. His know-how can make a big difference in your profit picture. Look him up under Tires in the Yellow Pages. *The B.F.Goodrich Company, Akron 18, Ohio.*

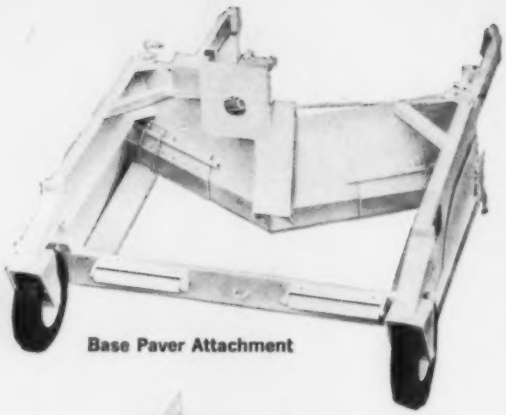
Specify **B.F.Goodrich Tubeless or tube-type tires when ordering new equipment**

. . . for more details circle 315 on enclosed return postal card

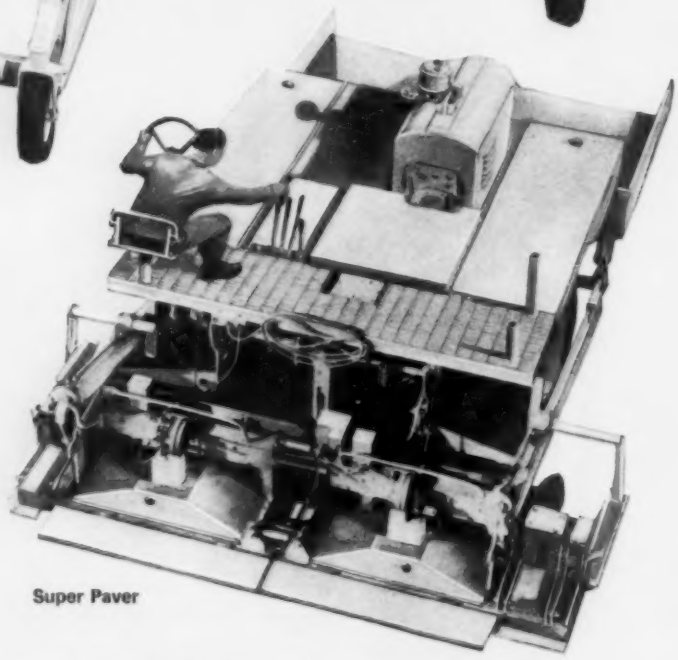
B.F.Goodrich



Self-Propelled Base Paver



Base Paver Attachment



Super Paver

Self-Propelled Base Paver—Big capacity unit spreads stone, slag, gravel, soil cement or plant mix aggregates 1" to 20" deep in widths from 10'-10" to 16'-0", at the rate of more than 400 t.p.h. Tractor unit is equipped with 21" wide crawler shoes for maximum traction and flotation on softest base. Equipped with high-speed oscillating screed, front wheel power steering, dual controls. Four forward and four reverse working speeds, one forward and reverse travel speed.

Base Paver Attachment—Big capacity unit designed especially for use with standard tractors of sufficient power. New universal hitch makes attachment easy. Equipped with its own engine-driven oscillating screed, and mechanical crown adjustment. Spreads stone, slag, gravel, soil cement and plant mix aggregates 1" to 20" deep in widths from 10'-10" to 16'-0". Hopper lifts completely for travel.

Super Paver—Automatic, air-electric fingertip controls, 12-ton hopper with hydraulic folding wings. Independent control of left and right conveyors interlocked with control of augers. Automatic control of material level ahead of augers. One piece screed in 10' width with extensions to 19'. Hydraulically driven tamper. Full hydraulic wheel steering. Eight paving speeds from 16 f.p.m. to 117 f.p.m. Four forward and reverse travel speeds from 6 to 11 m.p.h.

Drive wheels equipped with 16:00 x 25 low-pressure earth mover tires. Full power brakes. Gasoline or Diesel power plant. Option: revolutionary new grade control for averaging out grade imperfections, determining grade from guide devices, adaptation to previously cut grade variations and matching previously laid mat.

Suburban Paver—Automatic control, 4-ton hopper, hydraulic folding wings. Right and left conveyors synchronized with augers. One piece screed with extensions to 12'. Full hydraulic wheel steering. Five paving speeds from 10 to 127 f.p.m. Travel speed 8.6 m.p.h. New hydraflated 10:00 x 20, 12-ply tires, and locking differential. Option: new grade control for averaging out

THE NEW LOOK IN BITUMINOUS PAVING:

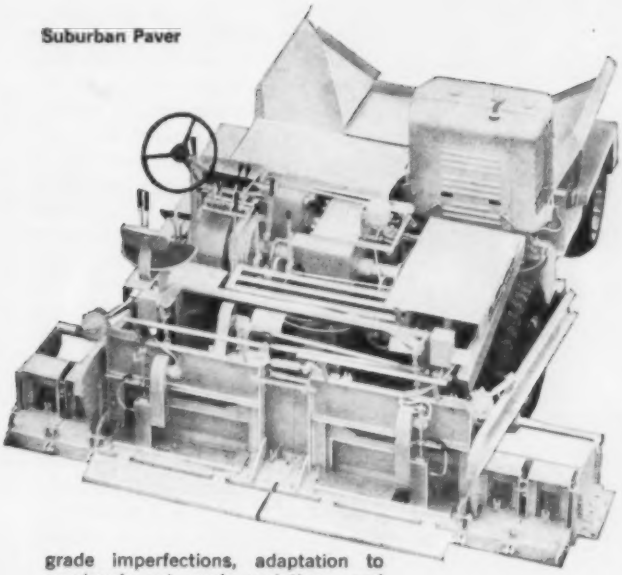
MORE AUTOMATIC,

Here's the bituminous paving line designed to give you top quality, fully automatic production from base course to final binder.

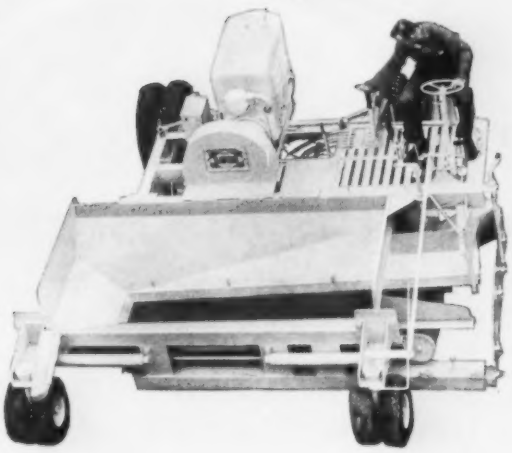
Check the automatic features, the capacity and versatility of these new and improved Blaw-Knox machines. They'll help you bid closer, work tighter and make more money starting right now.

Your Blaw-Knox distributor has all the information. He'll be glad to help you get started on the way to bigger paving profits. Blaw-Knox Company • Construction Equipment Division • Mattoon, Illinois.

Suburban Paver



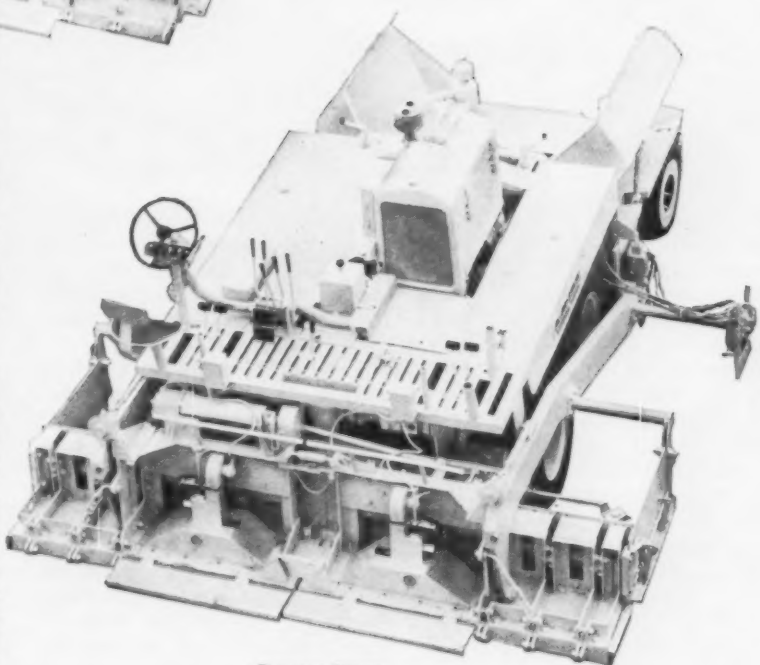
Road Widener



grade imperfections, adaptation to previously cut grade variations, and matching previously laid mat.

Road Widener—Versatile, one-man unit spreads any kind of aggregate, lays all types of bituminous mixes, spreads and finishes concrete. Spreads aggregate and bituminous materials in 2' to 10' widths, spreads and finishes concrete in 2' to 6' widths. 15' slip form attachment for concrete widening. Strike-off gate assemblies for each type material used. Spud vibrators for low slump concrete.

Express Paver—Automatic air-electric fingertip controls, 10-ton hopper with hydraulic folding wings. Independent control of left and right feed conveyors interlocked with control of augers. One piece screed design with extensions to 16'. Full hydraulic wheel steering. Eight paving speeds from 10 to 62 f.p.m. Travel speed 7 m.p.h. New hydraflated 10:00 x 20, 12-ply tires. Gasoline or Diesel power plant. Option: new grade control for averaging out grade imperfections, determining grade from guide devices, adaptation to previously cut grade variations and matching previously laid mat.



Express Paver

VERSATILE, RUGGED THAN EVER BEFORE!

BLAW-KNOX

Construction Equipment

. . . for more details circle 288 on enclosed return postal card

Push-Loading Is Where The Profits Start

Part 2 of a four-part discussion of the fundamentals of selecting and utilizing a scraper spread

By Kenneth F. Park
Consultant

Since the pit is the place from which high earthmoving performances and low costs will emanate and be controlled, it is practical to set up as high rates of excavation there as possible. Hence it is important to consider the best pushers. They become the hub from which performances and good costs radiate. The relation between the pushers and the scrapers should be such that one complements the other, each a half of an efficient team. Otherwise, juggle one or the other set of tools until they do match. The pusher is to scrapers as the shovel is to trucks. If scrapers are restricted in size, there is no need for applying big pushers, just match them.

If large scrapers are chosen for the company's use, the pushers should be chosen in relation to scraper size. Obtaining the ultimate performance is more a choice of pushers, than scrapers, to enhance their loading power. Actually it is not just the pusher that determines scraper sizes—although the loading process is spoken of in the pusher's ability to load. The scraper should add a substantial help—and gravity, too, is a substantial help. These will all be listed later.

In recent checks by the writer there are two makes of pushers that pre-eminently fill the bill. They are big machines, one of them weighing about 100,000 lb. The other around 85,000 lb.

Such machines should weigh as much as the smaller one mentioned in order to be able to put out the drawbar pull felt necessary. An effective pull of say 60,000 lb. should be available. Oft times the coefficient of traction will reduce this figure substantially, and weight is the biggest factor for correcting the deficiency. In soil or common earth, the tractor will put out about 90 percent of its weight in pull (or push) power provided there is sufficient horsepower. Expecting 60,000 lb. loading power then, the machine should weigh at least, say 70,000 to 75,000 lb. A "quickie" estimate of the belt horsepower needed is about 1 for each 200 lb. of drawbar felt to be necessary.

Such machines can cost up to a dollar a pound. They are worth their price though, and their owning and operating costs at about $18 to $25 an hour, can earn their owners substantial profits. This same tractor properly equipped for heavy ripping will cost about $25 an hour, or as high as $35 to $40 "all out" equipped. And again be worth its expense!

Rate of Loading

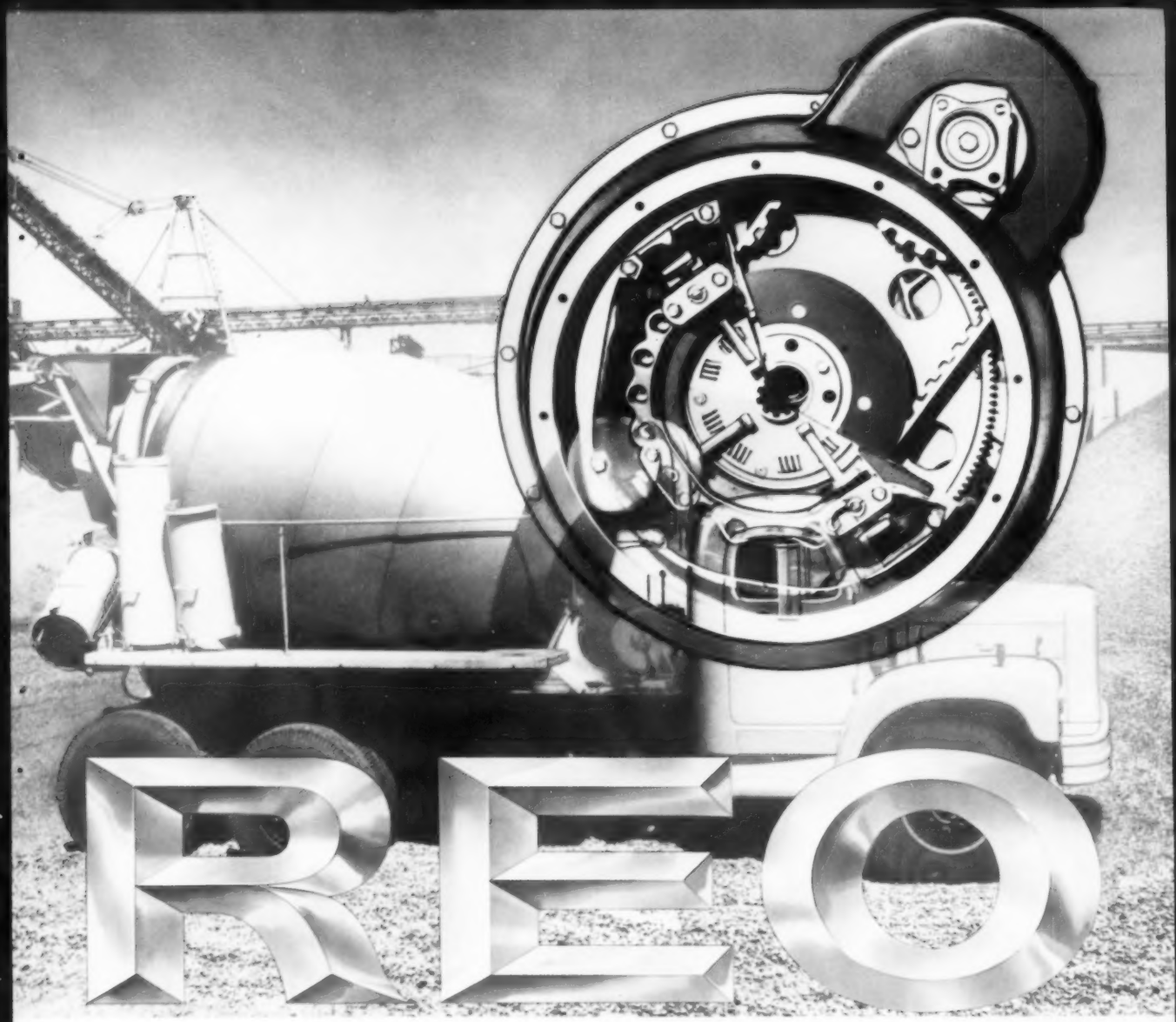
One of the loading rules this writer set up many years ago, was the fact that a crawler—or loading power if you will—could load at a rate of a pound of dirt per minute in a hundred feet, per pound of drawbar pull. With the small adjustments to the rule occasioned by extraneous conditions that have showed up during the years, the principle is still surprisingly applicable today.* It should be considered as *effective* pounds of load power however. Effectiveness creeps into the picture because there are a few depreciating actions that reduce the maximum power with which any kind of pulling or pushing action starts. For instance, loss of traction, power robbing elevations, loading grades, etc.

With the *effective* power figured and the rate at which it performs, it is a simple calculation to estimate the normal load. The power of the tractor plus the effect of gravity, plus the rate at which the scraper helps, plus the help that its increasing load also adds, create the loading power. There are, again, traction, bowl and load friction, elevation, weights, to consider-with their depreciating effect on maximum figured loading power.

With the pushers in mind come auxiliary, or helper tools. Direct drive machines are recommended, because of their superior performances for such heavy and tricky work. Converters always have power losses. New "power shift" controls help speed and simplify movements. An inside-mounted, narrow bulldozer is felt to be superior for power transmittal; for improved tractor balance; for quicker, safer maneuverability. Inside, heavy, rubber-bumper blocks cushion pusher contacts and speed the pusher's arrival. A heavy, rubber-bumpered push block on the tractor rear simplifies assist pushing in tandem loading. It speeds the pusher process and relieves operator fatigue, when the two (narrow dozer and push block) are working together.

Continued on page 96

*Caterpillar Tractor Co. experts point out that a D9 at 60,000-lb. drawbar pull can load 60,000 lb. into a DW21 or 631 scraper unit in about 0.75 minute. *Editor.*



PAYLOAD PROVEN... FLYWHEEL POWER TAKE-OFF

- **MARTIN BLOCK CORPORATION** "Most satisfactory even under extra heavy loads and tough operating conditions. We carry payloads more economically and we do not have the expense of a separate mixer engine." *Ray Chambers, Sr., Supervisor of Fleet Maintenance.*
- **READY MIX CONCRETE COMPANY** "We are more than pleased with our Reos equipped with Flywheel Power Take-Off. We save an additional 450 pounds in weight over our conventional equipment." *Lawrence Ross, Superintendent.*
- **MARSHALL SAND & GRAVEL COMPANY** "Very good results on our two Reo C-432s with Flywheel P-T-O. No maintenance costs so far after nine months of operation. Our Reos save us 1000 pounds in weight over our former equipment." *Robert Marshall, Partner.*

CONCRETE HAULAGE, INC. "In 11 months of service . . . no maintenance cost on Flywheel Power Take-Off of our three Reo C-442 models. The P-T-O is a very satisfactory way of operating transit mixers." *R. C. Martin, Manager.*

gold standard of values

REO MOTOR TRUCK DIVISION · THE WHITE MOTOR CO. · LANSING 20, MICH.

PUSH-LOADING

Continued from page 94

Incidentally, when the tandem idea is in operation, both tractors are similarly equipped for alternate positioning—a time saving and efficient fitting.

As a factor in the use of pusher help, the time between starting to load one scraper and the next, creating the cycle (time between loads), is of great importance. Each cycle is made up of the time spent in making the load, and the time in maneuvering to the next load.

What is the best loading time? Loading time can be studied and changed if found to create better conditions, but extensive and even unrelated studies have come up with the same "best" figure. One figure established over a variety of hauls and of many different lengths, is that 0.8 minute (48 seconds) loading time gives the cheapest cost per cubic "pay" yard. Obviously this period could change, but the fact that such a figure presented itself so often is enough to give it recognition and use. But change it if good honest figures indicate the need!

Transfer time is also important. Assuming 0.8 minute load time to be acceptable, the rest of the cycle for a single big pusher in normal conditions should not exceed 0.7 minute (42 seconds). A good clean tandem pusher job should make the transfer time in an average of 0.5 minute. It has been done in less than 0.4 minute. The so-called "transfer time" is the part of the pusher cycle outside of the loading time.

Loads per hour is the pay-off. In the case of the first figure, the pusher develops a cycle time of 1.5 (.8+.7) minute, or 40 loads an hour. This is a fair expectancy, but many jobs have been observed upon which the loader kept turning out 50 to 52 proper loads an hour.

In the days of auld lang syne, many years ago, lesser machinery and men averaged 30 loads an hour. Generally a minute to load, a minute to maneuver to another load—a two minute pusher cycle.

The number of loads an hour, times the amount per load gives the hourly pit production per hour. To this figure should be applied the right number of scrapers to keep the pusher busy. There is a calculation or two to make this possible. More on it later.

Pusher Needs

Condensing this tractor discussion somewhat, the big tractor to be the best producer should have (1) over 300 hp, (2) weigh equipped around 85,000 lb., (3) have speeds from about 1.5 mph to maybe 7.0 mph, (4) offer as much as 60,000 lb. drawbar, preferably more, (5) to be equipped, preferably, with inside, narrow rubber-bumper bulldozer; have a rubber-bumpered rear push-plate, direct drive.

Think of this machine having the ability to load, including not in excess 8 percent down grade, about 23 bank yards of loamy earth in not over 1.0 minute. In tandem, with another machine of identical type, these units have many times loaded over 40 bank yards per load in proper time. This is based upon a typical weight of 3,000 lb. per place yard.

The next typical, medium-sized tractors will offer about 17.0 or 18.0 bank yards loading in the minute, (2) have about 275 hp, (3) weight, operationally, about 65,000 lb., (4) have speeds from about 1.5 mph to 7.0 mph, (5) have about 45,000 lb. of drawbar pull for loading, (6) be equipped about the same as the big rig. A tandem operation is good here, too, and should load about 33.0 bank yards.

Best Scraper

Now let us consider the scraper judged best. Taking the 40.0 yard load as being desirable, on occasion, and a 30 percent swell as being typical, the scraper big enough to accept the loose volume should hold 52 cu. yd. heaped. For the single pusher with the 23 yard potential, the need would be for about a 35 yard heap. It is better to have at least a 40 yard capacity in order to accommodate lighter material, or that subject to greater swell, or the use of steeper loading grades. This compilation of figures should give anyone interested in this subject enough ammunition to make any pertinent study, from buying, to use.

Rubber-Tired Pushers

The only issue not covered is the question of rubber-tired pushers. There are many such machines, good ones. Many competitive checks have been made between them and crawlers, and while they have done well, in order to produce the same results, there are details to consider. One is the difference between traction characteristics. Good traction tires require about 65 percent more weight on them to produce the same pull or push as crawlers on average terrain. This requisite alone creates heft, and consequently extra cost. On the other hand, in pure sand where the coefficient of traction would be about the same for tracks or rubber, such a machine as a big rubber-tired pusher, with high horsepower and weight, could make a crawler cringe.

Good Scraper Requirements

Consideration for the scraper is now important, since the loading power is presumed to be set. A choice of the larger pusher is assumed in order to make performances as good as possible. A scraper that has made outstanding performances, in keeping with processes recommended in this article, is one handled by a diesel tractor with 350 hp. It will have ten forward speeds or power shift, with range from about 3.0 mph to nearly 40.0; a turbo-charged engine; Synchro-mesh transmission; a weight-transfer device to assist travel over surfaces with poor traction and in loading. It will be a four-wheeled unit; tires, at least 29.5 x 29s with 28-ply rubber. The scraper should be around 35 cu. yd., struck measure, cable controlled, with 33.5 x 33 26-ply tires. Then, weight should be, after modifications for typical local conditions, about 85,000 lb. for tractor and scraper empty. Unloading is by forced-out ejection. The heap measure is felt to be suitable at about 45.0 cu. yd. A flat bottom, with about three-section reversible offset center blades. This will be a scraper!

The most important things about scrapers are what they will do, and the cost of getting it done. At such a point as this, the results depend upon people. The planning, the procedures, the execution, the records are obiously routine. But there is *such* a difference in ultimate results.

Good Pit Necessary

First a good pit is necessary—one into which rigs to be filled can gain, preferably, more than one

Continued on page 112

CLEVELAND TRENCHER REPLACES 3 MACHINES – DOUBLES PRODUCTION FOR ROAD CURBING

On the 16-inch curbing job above, a Cleveland JS-30 Trencher:

- **truck-loaded excess spoil**
- **placed required fines for final backfill**
- **sneaked past poles and trees**
- **kept traffic lanes open**
- **replaced** { **one backhoe** / **one grader** / **one front-end loader**
- **DOUBLED DAILY PRODUCTION**

Nothing digs trench like a trencher — and the Cleveland Model JS-30 fits more jobs than any trencher ever built.

CLEVELAND TRENCHER®

THE CLEVELAND TRENCHER CO., 20100 ST. CLAIR AVE., CLEVELAND 17, OHIO

. . . for more details circle 297 on enclosed return postal card

Off-road workhorse, hardtop pickup . . . you can count on the new, low-cost SCOUT to whip you out to the job site and back comfortably, economically. The SCOUT carries three men in the enclosed all-steel cab, hauls hefty loads in the 5-foot box. It strips down for even faster action, too—roof, doors and windows are removable in minutes, windshield folds down. Powered by tough, new INTERNATIONAL 4-cylinder COMANCHE engine to save you gas. Ask your SCOUT Dealer for full details now.

NOW—with the

Scout®

ONLY INTERNATIONAL offers you such a wide range of all-wheel-drive trucks

From this tough little all-weather handyman to giants with 73,000 lb. GVW rating, INTERNATIONAL gives you today's most complete construction team! And INTERNATIONAL is in a class by itself for keeping you on schedule, too. A vast, nation-wide network of sales and service centers, plus 12 major parts depots, *makes sure of it*. Look at this line-up:

Always on the job: INTERNATIONAL model C-120(4x4) takes you in before the roads are in! GVW rating up to 7,000 lbs. This powerhouse has all-wheel bite and the famous INTERNATIONAL V-8 engine (6-cylinder and another V-8 model optional). Big 8½-foot box lets you bring along the whole construction shack on the first trip. Eight and 9-foot platform and stake bodies optional.

Grading, hauling, backfilling or blade-work: Versatile INTERNATIONAL model BC-180(4x4) can work any part of the job. This compact-design truck maneuvers easily in tight working conditions. Both front and rear have power take-offs to deliver INTERNATIONAL'S full V-8 authority where you want it. Gasoline or LPG 6-cylinder engine optional, GVW rating up to 20,000 lbs.

Moving a 10-yard load of rock: Rugged INTERNATIONAL model RF-190(6x6) has the power and traction to do it—out from under the shovel and back on the road without bogging down. It will perform under the most foul weather conditions. Six-cylinder engines up to 212 hp., GVW rating up to 43,000 lbs.

Transit-mix with traction to spare: A bear for work off the road, the INTERNATIONAL model RF-210(6x6) chassis will take that transit-mix load anywhere. Rated up to 52,000 lbs. GVW, now it offers you all the advantages of new INTERNATIONAL live-tandem bogie. Six-cylinder engines up to 212 hp., power steering optional.

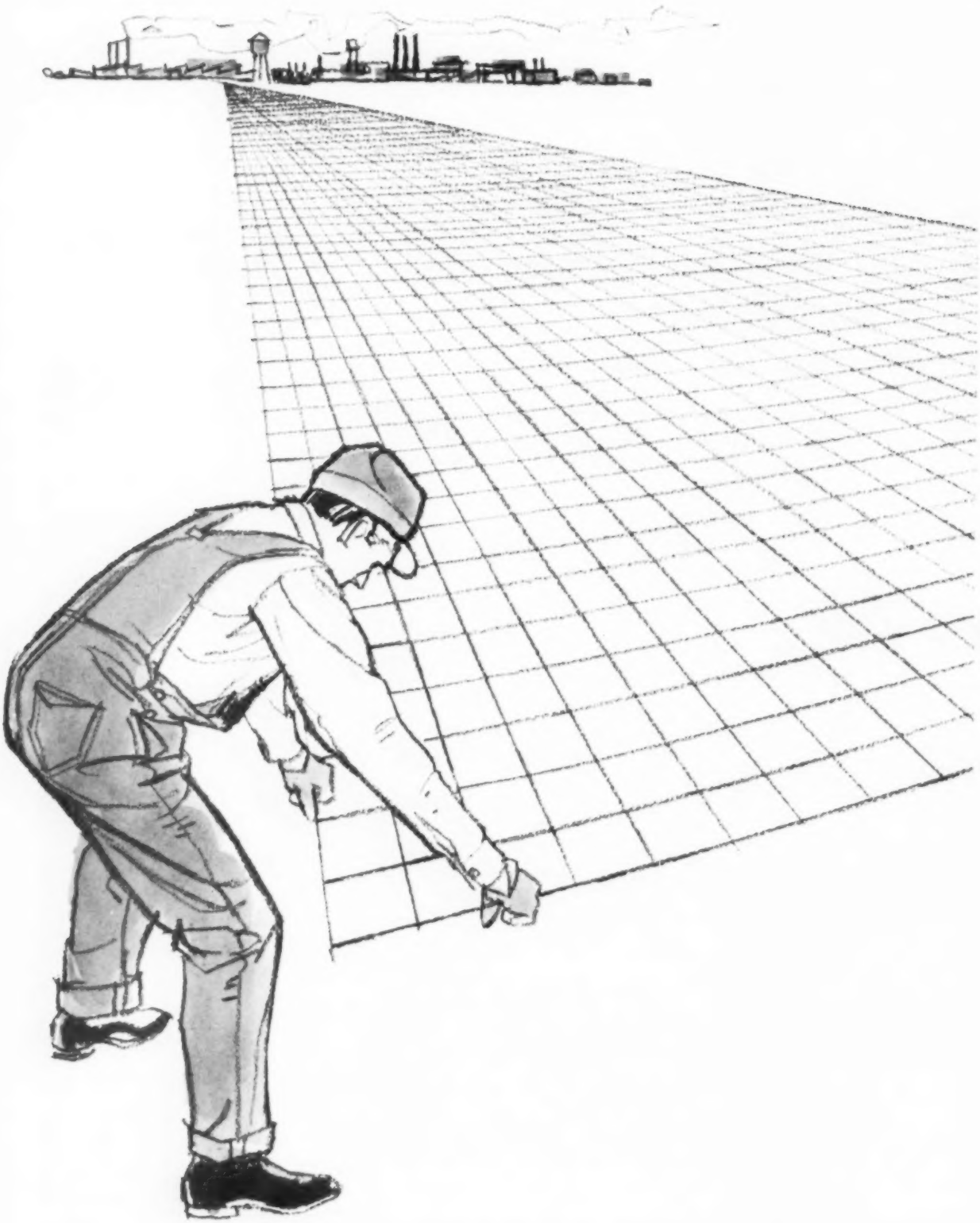
Need a dump truck right away? INTERNATIONAL will have one ready in 24 hours! Six-wheeler or single axle, your nearby INTERNATIONAL Truck Dealer or Branch can ship you the truck you select from their special Truck Sales Processing Center. It's one more example of the service INTERNATIONAL provides, to keep your job on schedule.

INTERNATIONAL® TRUCKS

WORLD'S MOST COMPLETE LINE International Harvester Company, Chicago

Motor Trucks • Crawler Tractors • Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

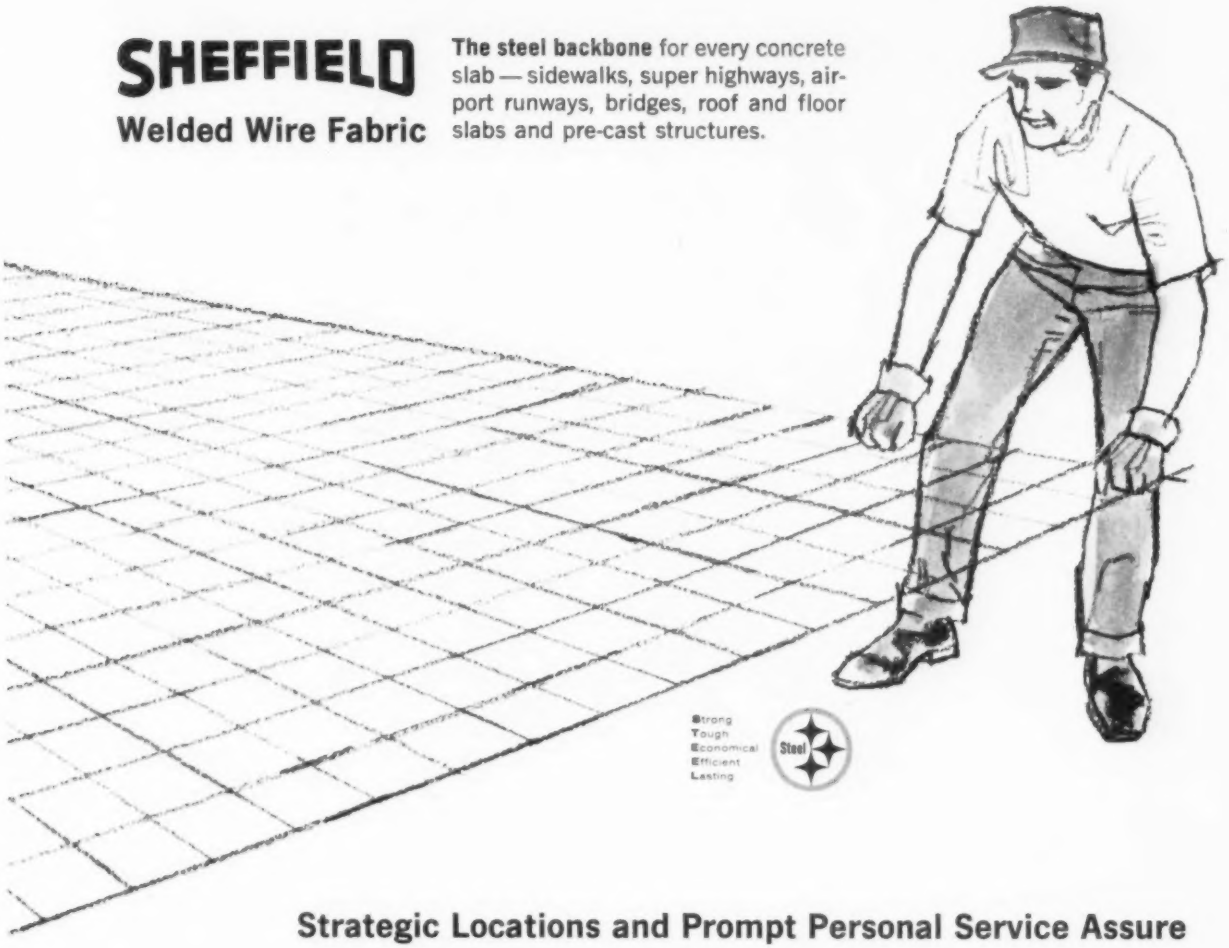
. . . for more details circle 322 on enclosed return postal card



SHEFFIELD

Welded Wire Fabric

The steel backbone for every concrete slab — sidewalks, super highways, airport runways, bridges, roof and floor slabs and pre-cast structures.



Strategic Locations and Prompt Personal Service Assure

On-Schedule Shipments

Sheffield has the production — on the world's fastest and most modern rod mill — and a stepped-up operation at all plants. Sheffield has the plant locations — placed right for on-time shipment anywhere in the mid-western, Gulf coast or western regions of America. Sheffield has the product —Welded Wire Fabric, quality controlled from furnace to finish.

Tell us when. We'll have it there on schedule in any quantity you need. Sheffield Welded Wire is available in sizes from 16 gauge to 7/0 gauge and every standard rectangular spacing. All are made in accordance with A.S.T.M. specifications. We'd like to tell you more. Write or call your nearest Sheffield office for full information. **Sheffield plants: Houston • Kansas City • Tulsa**

ARMCO Sheffield Division

. . . for more details circle 352 on enclosed return postal card

Finishers in foreground are floating surface after placing Unitube contraction joint with the bridge machine. Next machine: a Rex LRB108, which spread, finished and floated.

Paving Methods Adapted to Hard Stone, Temperature Range

Hard, angular aggregate and unusual temperature extremes sometimes can throw a monkey wrench into established concrete paving procedures. An example of this was observed on a recent paving job in South Dakota.

This project covering 5.6 dual miles of I-29 south of Sioux Falls was being paved by Sweetman Construction Co., of Sioux Falls, under a $1,245,000 contract. Formed dummy joints and a pozzolanic additive were permited in change orders to eliminate premature cracking and aid in getting a satisfactory finish.

The pavement design originally called for ⅛ in. by 2 in. sawed transverse and longitudinal joints. Sawing which was started in August, 1959, proved satisfactory until construction was resumed in spring 1960. The contractor then experienced warm daytime temperatures and near-freezing at night. Under this condition of widely varying temperatures, random cracking occurred at about 1,000 ft. intervals before the concrete had set sufficiently to permit sawing.

The problem was diagnosed as being due to a combination of temperature changes and the hardness of the aggregate—only 20 percent Los Angeles rattler loss. The hard-

ness of the aggregate slowed sawing, and the harsh stone made finishing of 2 to 3 in. slump concrete extremely difficult.

At the contractor's request, contract changes were adopted for a formed transverse joint. Unitube joints were placed at 61½ ft. intervals. Better workability was achieved by the addition of Pozzolith. This additive allowed a reduction in the water-cement ratio and practically eliminated finishing problems. No further random cracking was reported after this combination of changes. Pozzolith was substituted for cement on a cost basis without adding to the project cost. Unitube increased the cost by $0.012. Longitudinal joints continued to be sawed.

The paving train included a Gar Wood Buckeye subgrader; Flexible Road Joint fine-grader (on forms, D6-pulled) for 1-in. sand spread, sand cushion was finally eliminated; Bros Ron-O-Pactor for subbase final compaction; two Koehring 34E dual pavers; Jaeger spreader for first lift, this unit having mesh carrier; a Rex LBR 108 spreader-finisher for the top lift; the Unitube placer; hand float; and placement of polyethylene curing sheets. International BC 160 trucks with 2-batch loads supplied the pavers.

In South Dakota experience, mesh-carrying trailers riding on the forms have sometimes overloaded the forms and deflected them out of position. This contractor limited the load to four 25-sheet bundles to avoid this trouble. Another contractor is using trailer with two wheels at each corner of the trailer instead of one.

Concrete Sawing Equipment, Inc., of El Monte, California, subcontracted joint sawing. This specialist used two Concut saws. The front saw broke in new blades on the first cut to about 1 in. depth. Used blades were then transferred to the rear saw to finish the 2 in. cut. Hourly runs of 150 to 200 lin. ft. were maintained until concut provided special blades for the tough aggregates, stepping up production to between 250 and 300 ft. of full-depth-joint for the pair of saws. The toughness of the aggregate made it necessary to weight the saws with large rocks to hold them down.

J. R. Johnson was resident engineer on this job for the South Dakota state highway department.

Finishers seen placing sections of Unitube behind joint cutter.

Two Concut concrete saws cut 250 to 300 lin. ft. of longitudinal joint per hour using special blades designed for exceptionally tough aggregate.

Bucyrus-Erie 30B crane is loading Armco Sheffield wire fabric onto contractor-built trailer, which is pulled behind the Jaeger concrete spreader.

R. W. McKinney, Nacogdoches, Texas, New chairman of AGC Highway Contractors' Division, is congratulated by retiring chairman H. L. Royden, Phoenix, Ariz., while new vice-chairman, Walter F. Maxwell, Fontane, Calif., looks on.

Gov. John A. Volpe of Mass., retiring president of AGC, (left) passes gavel to new president, M. Clare Miller, McPherson, Kan., at 42nd annual convention in Boston.

AGC CONVENTION THEME

Continued from page 59

engineering judgment customarily used with all engineering contracts.

3. Reimbursement for job flagging cost at rail crossings, another point of controversy on federal-aid road work, was also clarified in a BPR memorandum dated January 16. "These two actions" (on Memo 20-5-60 and on flagging) noted Armstrong, "indicate the Bureau of Public Roads leaders' clear recognition of our problems as contractors. When a problem is clearly presented, the Bureau has shown fairness in cooperation to help solve it."

4. The continued work of the AASHO-AGC Joint Cooperative Committee came in for brief review. This group headed by W. Ray Rogers, of Portland, Oregon, and W. A. Bugge, Washington state highway director, held several meetings in 1960 and will meet six times this year chiefly in conjunction with regional highway meetings. The committee's Boston meeting took up mutual problems bearing on public relations, acquisition of borrow material, relocation of utilities, diversion of highway funds, rejection of bids in excess of estimates, size of contracts, change orders, state and local sales and use taxes, haul road restrictions and subcontracting.

5. The value of accident prevention to AGC members was strongly emphasized in the all-morning highway session. One of the AGC's foremost safety exponents, Don Kaser, Kaser Construction Co., Des Moines, Iowa, outlined his firm's successful job-safety program (Roads and Streets, January, 1961). Begun in 1948, this program has kept the Kaser firm in the top honor column through its low accident rating. "And," reported Kaser, "our program which has cost only $16 per worker per year has yielded us $125,000 in measurable dollars-and-cents return.

Kaser urged 100 percent AGC company participation in the safety program. "If this were our firm's only benefit from AGC membership," he told the audience, "our dues would be repaid four times over." He said that a job accident has a far-reaching effect on company profits through its depressing effect on employe morale, efficiency and productivity. Few contractors have given full thought to the hidden costs of an accident, i.e., the continuing pay of a convalescing worker, welfare plan cost affected, equipment damaged, lack of full efficiency of the worker on coming back to the job, and similar items.

Iowa AGC chapter member participation in the association's safety program is now 95 percent, Kaser reported. The Iowa chapter ranked third in the 1960 honor race. Kaser's own accident rate: 21.75, compared to 87.52 average for Iowa contractors.

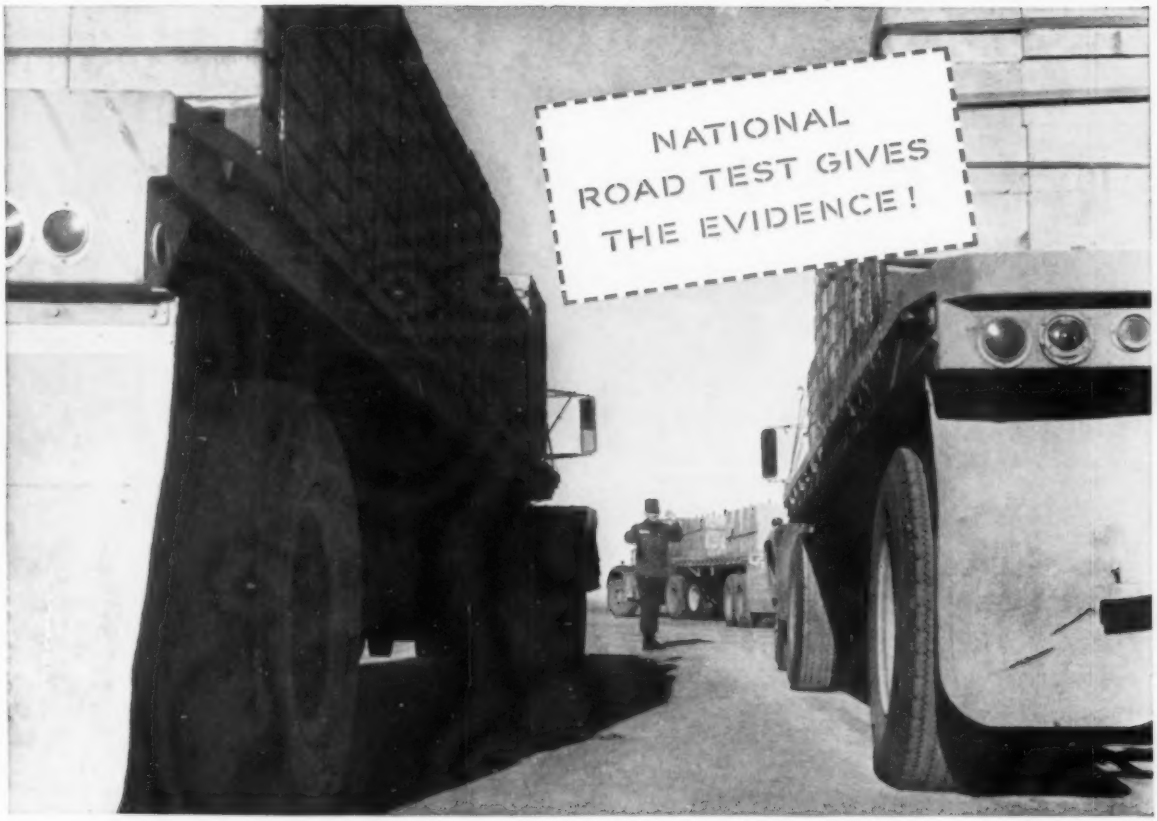
6. Subcontracting again was the subject of a spirited floor discussion at the Boston Highway session. Past-president George Koss, Des Moines, repeating his convictions voiced last October at the association's Phoenix board meeting, asked for a vote to recommend that the BPR relax the 50 percent limitation on subcontracting on federal-aid highway work. His motion was voted down. Koss said that contractors on Interstate highway projects in states which let package jobs are "in trouble"; heavy structure work along with grading and paving make it difficult for the contractor to control all the work.

In rebuttal Robert Haley of Philadelphia reminded the audience that highway-heavy contractors in AGC have been proud of their ability to stay out of brokerage type of contracting, such as prevails—and has brought so many headaches—in the building field. He voiced belief that the relaxation of the 50 percent limit, where done, has been to the highway contractor's detriment.

"A general contractor should be able to handle two out of three of the grade-structure-pave elements," he said, since specialty items such as electrical work are not under the Bureau's 50 percent restriction.

In view of the BPR's flexible approach in interpreting the 50 percent limitation, the state highway chief engineer should be asked to

Continued on page 109



Concrete wins over asphalt these basic ways...

Sponsored by The American Association of State Highway Officials (AASHO) . . . directed by the Highway Research Board of the National Academy of Sciences—National Research Council. Here is the most scientific pavement test ever made. Accurate instrumentation checked performance of test sections during 2 full years of traffic. 99 trucks, 19 hours daily, 6 days a week. There were 17 million miles of travel—1,113,762 load applications!

1

DURABILITY

A count of pavement sections surviving in the great National Road Test, after two full years of traffic, showed concrete outlasted asphalt 3 to 1! Here is new confirmation that concrete gives more for tax dollars.

2

DRIVING COMFORT

In ratings of how test pavements retained the riding quality they started with, concrete won over asphalt by a wide margin. Only concrete can give lasting driving comfort without excessive maintenance.

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

University tests prove this steel guard rail has kept its strength

...after 20 years of continuous service

The first section of steel beam guard rail installed in Pennsylvania (in 1940) was selected for supplying specimen rails to test the strength of the steel after 20 years of continuous service.

Test rails were selected and removed, including one which was known to have been involved in a collision.

Here is proof that steel guard rail keeps its strength even after 20 years of continuous service in every kind of weather. In order to demonstrate that the strength of steel rail is *not* affected by time or the elements, a leading university made the following test:

Rails were taken from the first installation of steel beam guard rail in Pennsylvania, erected in 1940. All test rails had seen 20 years of service, with very little maintenance, and one was known to have been involved in a collision.

A test was set up at the university's research center in which the rails were subjected to loads applied in increments of 200 lb at the center of a 12 ft clear span, traffic-side up. Deflections were measured accurately.

Each steel guard rail tested passed with flying colors, remaining well within the test requirements. After 20 years of service, these rails had approximately the same strength as when they were installed. Further, the test indicates that notions about steel losing strength after long periods of continuous exposure just aren't true.

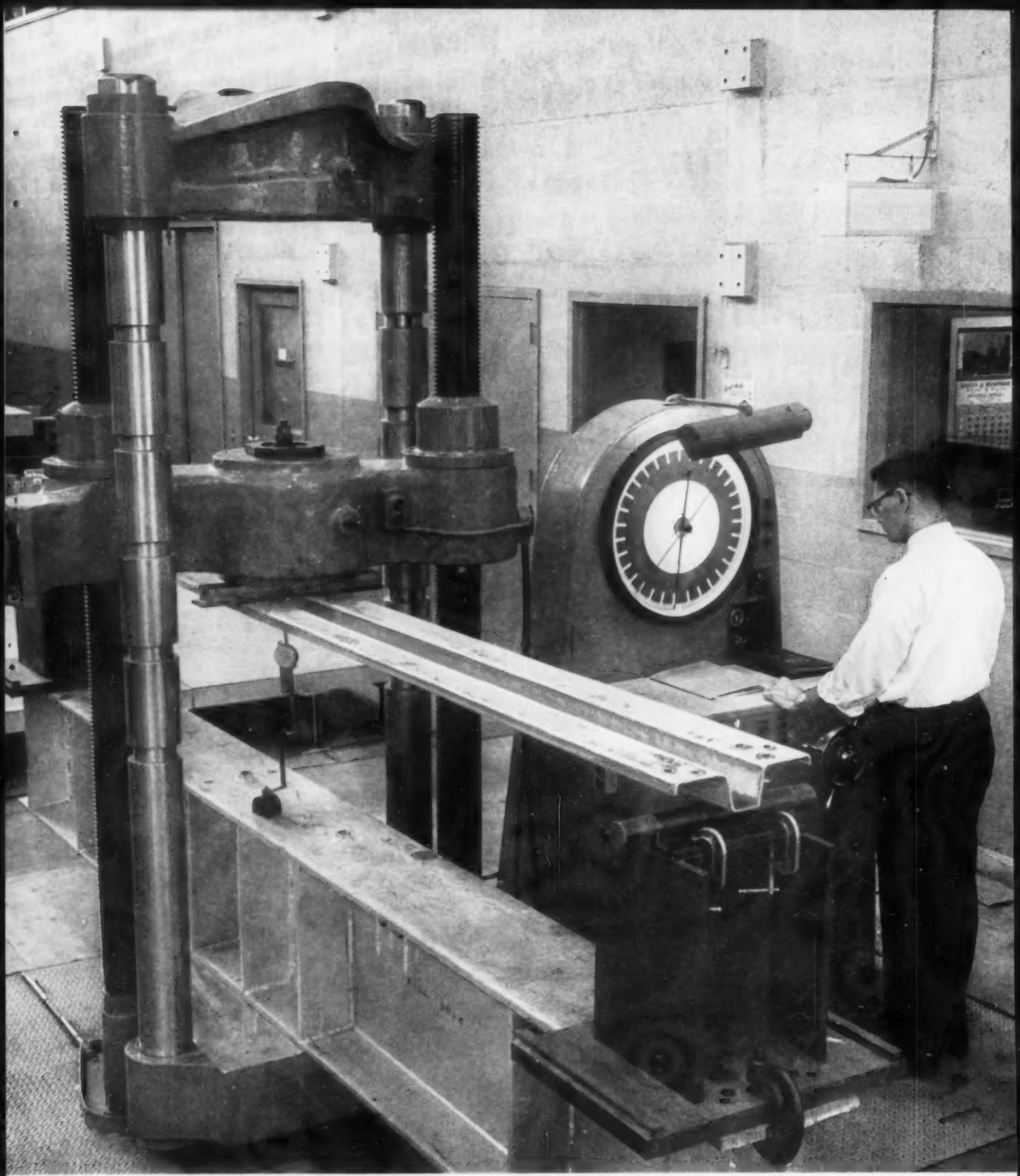
For detailed information about this test, write to us at any sales office, or direct to Bethlehem, Pa. And for more information on steel beam highway guard rail, ask for a free copy of our booklet 514.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation

Steel

For Strength ... Economy ... Versatility

BETHLEHEM STEEL



At the university, the test rails were mounted so that loads could be applied at the center of a 12 ft span. Loads were in 200 lb increments and deflection carefully measured. Result: steel guard rail has approximately the same strength after 20 years of service as when it was first installed.

BETHLEHEM STEEL

. . . for more details circle 286 on enclosed return postal card

WHY THE BIG SWING TO FORD POWER?

Three good reasons

1 **ALL FORD INDUSTRIAL ENGINES are modern overhead valve design**

2 **FORD INDUSTRIAL ENGINE SERVICE is available EVERYWHERE**

3 **FORD INDUSTRIAL ENGINE PARTS cost less**

Only Ford offers a complete line of modern, overhead-valve-design engines. Ford Industrial Engines range from 134 to 534 cubic inch displacement, including modern diesels. These are *compact* engines, delivering more horsepower per pound of engine weight than ever before possible! And all Ford gasoline engines are short-stroke for greater fuel economy and longer life.

No matter *where* he's located, a Ford industrial power user can count on less downtime . . . because there's always a Ford Dealer nearby to give him service *when he needs it!* Stretching across the country, too, is a complete network of Ford Industrial Products Dealers providing the kind of fast, efficient service that cuts operating costs.

Speaking of cost . . . Ford industrial power users *really* save on engine parts! Due to Ford's high volume production, parts are priced low. And with 26 Ford Parts depots strategically located across the country . . . delivery of those parts is *immediate!*

These are just a few of the reasons why *you* should join the swing to Ford power. Call or write to the address below.

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED!

Ford
INDUSTRIAL ENGINES AND POWER UNITS

INDUSTRIAL ENGINE DEPARTMENT, FORD DIVISION, FORD MOTOR CO., P.O. BOX 598, DEARBORN, MICH.

West of Rockies write to:
→ FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 6787, LOS ANGELES 22, CALIF.
→ FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 1666, RICHMOND, CALIF.

. . . for more details circle 308 on enclosed return postal card

AGC CONVENTION THEME *Continued from page 104*

recommend the percentage that best serves the public interest on each job, suggsted N. K. Dickerson, Jr., of Monroe, N.C.

7. "New developments of interest to highway contractors," an agenda topic, drew request for a discussion of the pros and cons of slip form paving. A California contractor strongly urged contractors to "keep away from slip form pavers if your state checks your smoothness results with a profilometer." Contractors in California who sold their side forms are buying them back again, he said.

Quick counter-discussion came from several contractors. A spokesman for Northwest Engineering Co., of Wyoming, said his firm has done six jobs in five years with good success. "But you must get a smooth subgrade," he added. And he suggested that the best job superintendent for slip-form jobs is one who hasn't had a lot of experience with conventional form-riding methods. "The first 50,000 square yards of one of our Wyoming jobs was rough for this reason," he said.

Slip-form methods save about 50 cents a square yard, this spokesman said in conclusion.

Highway Program Outlook

The culmination of AGC's Highway Session was a question-and-answer discussion headed by a panel of Washington leaders: George H. Fallon, chairman, House of Representatives roads subcommittee; Gordon H. Sherer, ranking minority member of this committee; Rex M. Whitton, new Federal Highway Administrator; and A. E. Johnson, executive secretary of AASHO.

Speaking here in Boston on the very morning of President Kennedy's highway message to Congress, Congressman Fallon (D., Md.) told the audience that he would press for new taxes to put the road program back on schedule. But first, Congress must approve the new cost estimate.

"We need at this time to reaffirm the original completion date (1970) of the Interstate program," he said. This job is more important today than when it was voted in 1956 because the original estimates of traffic growth have been overshadowed. "By 1972 we'll find that a whole new program will have to be started."

Financing and fund release formulas which will iron out peaks and valleys of award levels in the states are important goals, Congressman Fallon added. He said he would seek elimination of the Byrd Amendment. Also, for ABC roads, three $25 million yearly step-ups from the present $925 million federal appropriation would be sought "to keep the road program in balance."

The problem of keeping on schedule with the original 13-year Interstate program (with the 1,000 miles since added) is to raise from $9 to $11 billion additional funds, said Congressman Sherer (R., Ohio). While not favoring an uneconomic crash program, he went on record as being unalterably opposed to the stretch-out of the "I" program advocated by the oil industry and auto clubs. "Each dollar invested in roads brings four dollars in benefits," he said. This leader also will oppose borrowing for roads as inflationary and favor pay-as-you-go financing.

Praise for the job done by contractors on the Interstate program since 1956 came from panelman Rex Whitton. He reviewed the progress made, noting that 25,000 miles of the 41,000-mile Interstate system have been built or are in work-stages.

The 13-year job is 25 percent completed, and in the 1956-1961 period $9.8 billion has been made available from the Highway Trust Fund.

"Whenever a completed road is dedicated in your state," Whitton counseled, "the contractor who built it should be present along with the project engineer."

The fourth panelman, A. E. Johnson of AASHO, began by recalling his remarks at AGC's year-ago convention in San Francisco. There he said investigating committees would find the road program to be the cleanest program such committees ever investigated. "This belief is re-affirmed here today," he told the Boston audience, adding that "some good has come out of these investigations by jarring us out of our lethargy."

While praising the Blatnik committee staff for its high caliber, he said it is too bad this committee fails to show the "other side:" the excellent work represented by the great majority of highway projects.

Over 20,000 copies of AASHO's new Quality Control Guide (See February, Roads and Streets) have been distributed, said Johnson. Concluding his remarks on quality of construction, he observed that "integrity is something you can work on all your life and then lose it in a second."

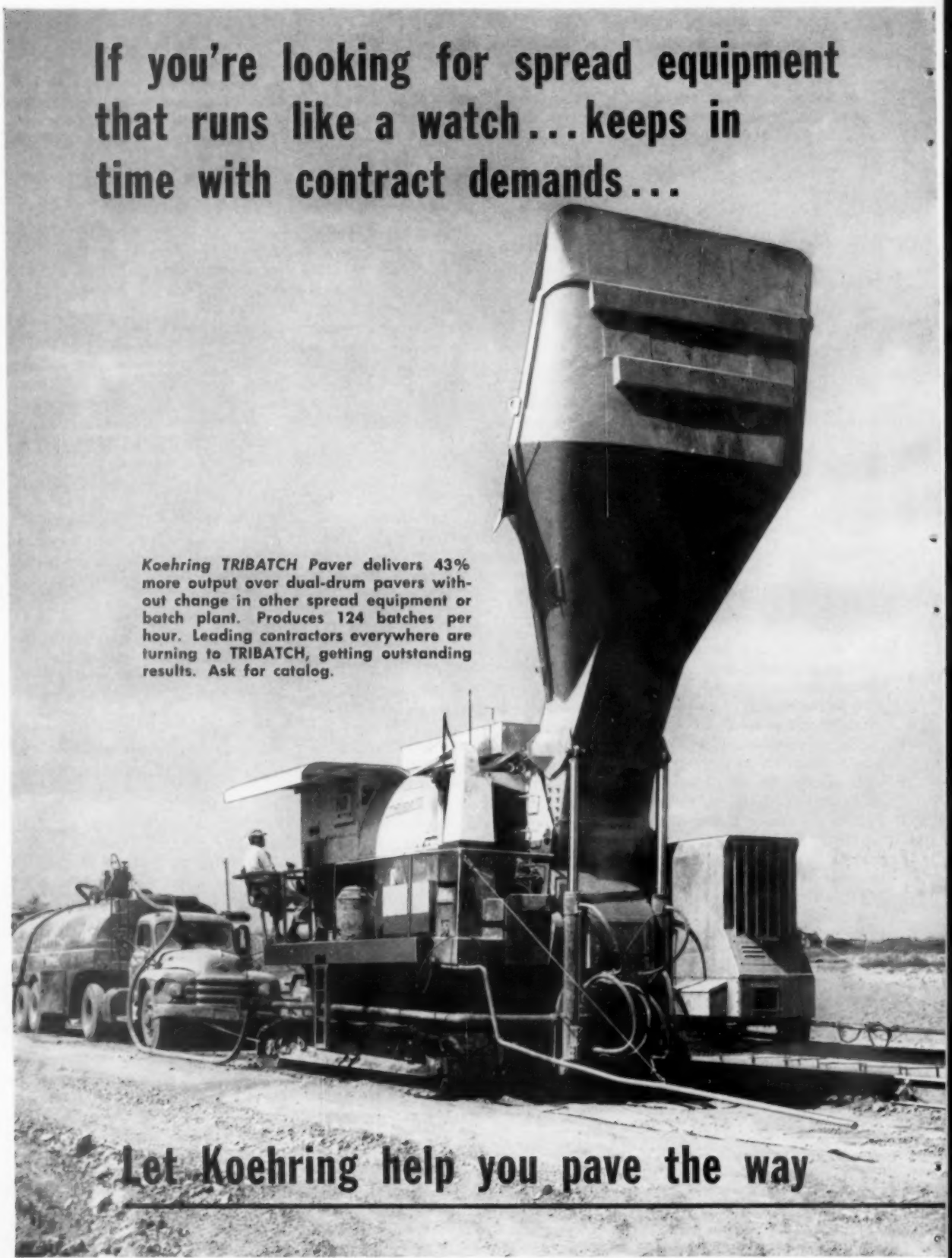
Alaska Plans Pioneer Access Roads

A progress report on Pioneer Access Roads by the Alaska Division of Highways reveals that a program for such roads is well under way. Nearly all funds appropriated by the 1960 State Legislature for natural resource development roads have been programmed and allotted. Preliminary engineering has been completed on eighteen road projects, with final determination made on fourteen. Five roads were completed in 1960 and ten projects are under construction. Construction has commenced on ten roads, with five having been

Under the Pioneer Access Program, petitions for construction under the Act are reviewed by the Commissioner of Natural Resources. Those found to qualify are forwarded to the Commissioner of Public Works for engineering feasibility studies. Cost estimates and other feasibility data is then prepared by the Division of Highways and the final determination made by the Commissioner of Natural Resources.

After receiving approval to construct a pioneer access road, highway engineers contact local citizens, business and industry and contract with them to perform the work under a minimum of engineering supervision.

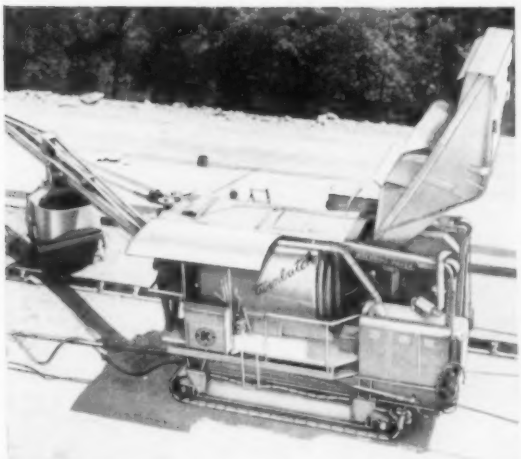
If you're looking for spread equipment that runs like a watch... keeps in time with contract demands...



Koehring TRIBATCH Paver delivers 43% more output over dual-drum pavers without change in other spread equipment or batch plant. Produces 124 batches per hour. Leading contractors everywhere are turning to TRIBATCH, getting outstanding results. Ask for catalog.

Let Koehring help you pave the way

Count on Koehring



This 34-E Twinbatch Paver will pour over 85 batches an hour on a 60 second mix cycle. Ideal for teaming up with the TRIBATCH paver on big volume jobs and for handling medium-sized paving jobs alone. Has unmatched record for dependability and production among dual-drum machines.

Harsh, wet or dry . . . all consistencies of concrete can be handled quickly, efficiently, by the Koehring Longitudinal Finisher. Produces smooth, mechanically accurate slab with uniform crown transitions. On the job above, it finished 1214 batches a day.

Koehring Transverse Finisher gives you three traction speeds for finishing, one for traveling. It finishes slab from 10 to 30 feet wide, meeting strict specifications. Two adjustable oscillating screeds. A single lever control assures uniform crown transitions.

Mobile 16-E Paver puts your curb, gutter, centerstrip and scattered paving jobs on a profitable basis. It's as mobile as your batch trucks. High elevated discharge makes pouring to overhead hoppers, forms, and chutes easier. Useful as a utility unit or general purpose paver.

to Bigger Profits in '61

KOEHRING

DIVISION OF KOEHRING COMPANY

Milwaukee 16, Wisconsin K161

. . . for more details circle 332 on enclosed return postal card

BIG VIADUCT JOB *Continued from page 63*

tween the form and the void.

Directing of the pour from the bucket down each side of the wooden void is handled with help of a form-riding dolly that travels beneath the cement bucket. The dolly is designed to force the pour into the space between the void and the forms. It is rolled along by hand as the Travelift moves the cement bucket down the beam.

Handling the 2-yd buckets—shuttling them between the batch and mixing plant and the beams—is mere child's play for Griffith personnel, thanks to the ingenious modification of an old BX Mack dump truck. By removing the dump bed and reversing the lifting mechanism and then adding two steel hooks at each corner of the rear of the lifting frame Griffith came up with a mobile bucket carrier that can speed two buckets at a time back and forth between the Travelifts and the mixer several hundred yards away across the yard. It's a one-man operation with a modification of a piece of equipment that most contractors sent to the scrap yard years ago.

The current contract calls for production of five beams per day. In view of the layout of the prestressing facility and the choice of equipment, there is no question but that this can be maintained with relative ease. To do so, however, means the handling of a large amount of material. In addition to the 2.5 million feet of cable, Griffith Co. will also use over 720 tons of reinforcing bars and 13,000 cu. yd. of concrete for this out-sized freeway structure job.

PUSH-LOADING—WHERE THE PROFITS START *Continued from page 96*

entry. A perfectly flat area lends itself to good manipulation. Rigs then can come in from the top or the bottom (according to stationing) to take their almost instantaneous position alongside a scraper being filled.

This allows a side-swing pusher positioning at the back of the new rig for rapid loading help, without the need for continual backing up to gain that same position. Loading can then proceed alternately in one direction, then its reverse. Many loads an hour can be added to pit output by the practice of this procedure. Many narrow, or precipitous cuts prevent this practice. In any case, a down-hill loading slope of not in excess of about 8 percent is deemed the most effective.

Keep Moving

Keep Moving- It is not necessary for a scraper to await a pusher contact before starting to load. The first part of the load is taken in so easily that a scraper can obtain quite a few pounds of earth before the earth weight and friction steady down the entry to very little. After the pusher is working, forward motion should be constant. A regular rate is recognizable; the operator can feel it. Any attempt to increase the speed of earth entry into the bowl is apt to result in a stall—with the blade hung up too deep in the ground. In momentarily stopping all loading flow, the dirt becomes static. Breaking the friction loose again and getting the weight moving, in and up, is a power and time consumer. It is then difficult to obtain the same amount of earth as that which continually moves in during undisturbed travel. It takes more power, a deeper cut, longer time.

Time a few loads at the prescribed 0.8 minutes, and weigh them. The operator should be able to duplicate load sizes by observation, and further by the feel and sound of his engine.

"Pumping" is a practice many operators resort to in sand, gravel, or other difficult material—and is all right. After raising the blade to allow the rig to gain a momentary higher speed, the blade is quickly dropped to force itself deeper into the cut. Earth flow is increased, but extra pressure should be shortly released to allow otherwise normal travel.

The pusher operator should also be observing load heaps and loading time, so that a routine can be established to develop the best possible performances. A horn on the pusher dash can be used to good advantage to get scrapers under way quicker. Scraper operators don't always like this, but if they can be instructed, telling them why it is done and the advantages of following such practice, they are inclined to do a good job.

Scrapers Should Help Load

The scraper itself should add a substantial help to loading. Severe tire wear is occasioned by too enthusiastic and, for that matter, careless use of the machines however. Many operators have insisted upon keeping the scraper power down to a point of just leaving enough to insure moving under their own power. This is deemed a mistake. Such machines can be used to assist in pulling in about 7 cu. yd. of extra material. The normal assist assumed possible, by one of bigger types of scrapers, say a 45-yd. heap unit, is 15,000 lb. of pull. With the recommended Tractionaider (a hydraulic piston to transfer about 15,000 lb. from the scraper front to the tractor drive wheels) another 5,000 to 7,000 lb. of loading power is made available. The scraper pull is then assumed at 20,000 lb. Its use has been sufficiently tested to know such a figure is practical. This can be produced for loading without spinning tires, or in any other way proving detrimental to the rig. Instead of idling through loading then, to detract from the pusher's loading ability, this device becomes a helper of no small caliber.

Aluminum Railing for G. Washington Bridge

More than 27,000 ft. of aluminum railing is being used for the new lower-level deck of the George Washington Bridge into New York City. The railing is manufactured by Michael Flynn Manufacturing Company. A one-rail and a 3-rail design adopted by the Port of New York Authority will save 370,000 lb. due to the lightweight material.

THE NEW LITTLEFORD SPRAY MASTER

bituminous distributor

Littleford's new Spray Master Distributor has been designed with one idea in mind... to provide the construction industry with the most advanced unit ever produced. Engineering and design features of the new Spray Master are ***the first really big changes in the bituminous distributor field in the last twenty years.***

make sure you get the most for your money--the Spray Master

For complete information on Littleford's NEW SPRAY MASTER return this postage-free air mail reply card.

Please send information on the New Spray Master

name .....

address .....

city *zone* *state* .....

name of firm .....

position *telephone number* .....

Littleford offices in Cincinnati, Ohio and Albany, New York

LITTLEFORD Bros., Inc.

INTRODUCING THE NEW SPRAY MASTER

bituminous distributor by Littleford

The new Littleford Spray Master illustrated above is equipped with aluminum jacketing, catwalks and skirting. You can purchase the style you desire... with or without these deluxe features. Regardless of style selected, the spray bar and exclusive features shown on this page are standard equipment. Whatever your choice of style, the Spray Master contains the most advanced engineering designs and labor saving features available to the industry today.

1. SINGLE LEVER CONTROL

. . . no confusing levers, but one easily understood capstan-type hand wheel. Controls all operations.

2. ROOMY OPERATOR'S PLATFORM

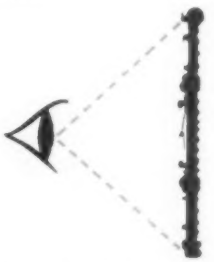
. . . no need to crawl up, under, around, or hang on. The Littleford Spray Master has a large, roomy platform provided for the operator's safety.

3. MODERN CONTROL PANEL

. . . all important controls are located in this panel board within easy reach and view of operator.

4. HINGED HOUSING for EASY MAINTENANCE

. . . working parts are easily accessible through Littleford's new exclusive hinged cover maintenance. One piece assembly swings back permitting easy adjustments when necessary.



5. UNOBSTRUCTED OPERATOR'S VIEW

. . . no part of spray bar is hidden by overhanging obstructions. The operator sees all of the bar . . . he knows how the bar is operating.

FIRST CLASS
PERMIT No. 23
(Sec. 34.9 P.L.&R.)
Cincinnati, Ohio

BUSINESS REPLY CARD

postage will be paid by

LITTLEFORD Bros., Inc.

AIRMAIL

453 EAST PEARL STREET, CINCINNATI 2, OHIO

For detailed information on the NEW Littleford Spray Master return the postage paid Reply Card on this page.

Bituminous features appear
between pages 115 through 129

Colorado Upgrades Gravel Hot Mixes With Lime

By Bud A. Brakey

District Materials Engineer
Colorado Department of Highways,
Grand Junction

The Colorado highway department three years ago began experimenting with hydrated lime, pulverized limestone, and portland cement as mineral dust fillers in hot mixes. Based on their successful use, these fillers are finding wide application throughout the state.

Hydrated lime, in particular, has become important, especially in conjunction with borderline aggregates. Due to its chemical nature and extreme fineness, however, lime actually performs more like a chemical additive than simply as a void filler. It has increased the strength and stability of asphalt mixes, also making these mixes more water resistant by permitting the use of more asphalt in the mix without the resultant loss of stability as would happen without lime. Swell, water absorption, and stripping also have been reduced. In addition, in our experience, lime tends to toughen the mix, permitting faster compaction and the attainment of higher densities.

The first project in the Grand Junction district involving lime additive was built in 1959—a 4.9-mile section of US 50 east of Gunnison. This article will describe three additional projects built in 1960, including US 40 east of Muddy Pass (7 miles), SH 14 north of Muddy Pass (8.8 miles), and US 50 east of Gunnison (2.8-mile continuation of the 1959 project). The two jobs at Muddy Pass were built under one contract by C. L. Hubner Co., Denver. The contractor on the Gunnison project was Colorado Constructors Co., also of Denver.

Why Lime?

In Colorado nearly all hot mix aggregates are produced in contractor-operated portable plants using local gravel supplies. Some of the aggregates are well-graded and suitable without any additive being needed. However, due to the mountainous terrain, many of the deposits are poorly sorted and tend to be "dirty", i.e., containing small amounts of clay, particularly of the swelling type like bentonite. As a result the aggregates from these pits are often slightly plastic, have an affinity for water, swell considerably, and tend to strip. If these marginal gravels are used without being upgraded by an additive, the asphalt pavements will have poor stability and lack durability. As in soil stabilization, the additive permits local aggregates to be used, and at a considerable saving over

Table 1
Immersion-Compression Test Results

Preliminary laboratory test data for U.S. 50 project near Gunnison, Colo.

	Untreated Aggregate	Lime-Treated Agg.	Spec. Limit
Asphalt Grade	120/150	120/150	
Asphalt (% of Mix)	6.0	6.1	
Specific Gravity	2.33	2.34	
Wet Strength, psi	123	298	
Dry strength, psi	367	398	
Stability, W/D ratio	34/100	75/100	
% Absorption (by wt.)	3.86	2.18	+75/100
% Swell (by vol.)	1.77	0.84	−4%

the more costly import of higher quality materials.

Improvements imparted by hydrated lime can best be seen through three laboratory tests used by the Colorado Department of Highways to evaluate asphalt mixes —the Immersion-Compression, Stabilometer, and Cohesiometer tests. The Immersion-Compression test, which was developed by the Bureau of Public Roads about 15 years ago, in particular demonstrates lime's waterproofing and strength developing qualities under these circumstances. In this test six 4 x 4 in. cylinders are cured for one day at 140°F., then half of them immersed in a water bath for four days at 120°F. Unconfined compressive strengths are determined after the one-day dry cure on three specimens and after the 4-day soaking period on the other three. On the basis of this test, Colorado requires a wet-dry strength ratio of 75/100 for the mix to pass. In addition, the limit on water absorption is 4 percent.

If the natural material is found to be substandard, the highway department tries various additives, and in varying amounts. The additive finally selected is based on the extent of improvement and on job economics. If additives are not feasible, a new pit source is recommended.

In the case of the Gunnison project (see Table 1), the local gravel was substandard, the hot mix having a W/D ratio of 34/100. With the addition of 1 percent hydrated lime, however, the ratio increased to 75/100, and the water absorption and swell were reduced by approximately 50 percent. On the Muddy Pass job (Table 2), the untreated gravel actually passed the W/D and water absorption specifications, but was considered submarginal on the basis of such secondary criteria as the stabilometer, voids, and density values. (The latter are used as a guide in mix evaluation).

After 1 percent of hydrated lime was added, the W/D ratio increased to 85/100, the absorption and swell dropped substantially; and the stabilometer and density values were increased above the highway department's desired minimum lim-

Continued on page 118

Table 2
Immersion-Compression Test Results

Preliminary Laboratory Test Data for U. S. 40 and S.H. 14 projects near Muddy Pass, Colo.

	Untreated Aggregate	Lime-Treated Agg.	Spec. Limit
Asphalt Grade	120/150	120/150	
Asphalt (% of Mix)	6.1	6.6	
Specific Gravity	2.23	2.25	
Wet Strength, psi	254	282	
Dry strength, psi	329	333	
Stability, W/D ratio	77/100	85/100	
% Absorption (by wt.)	2.03	1.04	+75/100
% Swell (by vol.)	0.50	0.20	—4.0

Stabilometer Test Results

	Untreated Aggregate	Lime-Treated Agg.	Desired Limit (not specified)
Stabilometer	34	37	+37
Cohesiometer	152	226	+50
R_t Value	94	98	+90
Voids—Total Mix	5.5	4.8	3-5%
Voids Mineral Agg.	18.8	19.2	15-20%
% Voids Filled	71	75	75-85%
% Theo. Max. Density	94.5	95.2	95-97%

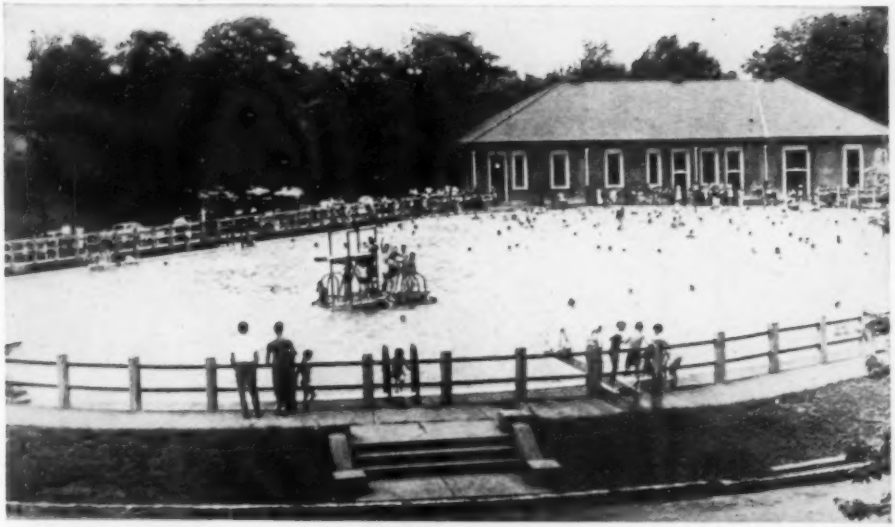
Table 3
Project Quantities

	S.H. 14	U. S. 40
Subbase (Class 2)	49,200 tons	.....
Gravel Base	30,700 tons	5,200 tons
Gravel with Cement	.....	13,600 tons
Asphalt (200/300)	850 tons	930 tons
MC-1 Prime	54,100 gal.	55,800 gal.
Plant Mix	12,200 tons	13,300 tons
Lime Additive	122 tons	133 tons
Soil Cem. Processing	.....	122,900 sq. yd.

Table 4
How Lime Upgraded Gravel

% Passing	Untreated Gravel	Stockpiled Matl. Plus 1% H. Lime	Field Sample 1	Field Sample 2	State Spec.
2½ in.	100	100	100	100	100
2 in.	100	100	100	98	95-100
1½ in.	87	87	89	95	
1 in.	66	66	70	77	
¾ in.	59	59	62	69	
⅜ in.	43	44	46	51	
4 mesh	32	33	35	40	30-60
10 mesh	25	26	27	31	
40 mesh	13	14	14	16	
100 mesh	7	8	7	9	
200 mesh	6	7	5	8	5-15
L.L.	28.8	N.V.	N.V.	N.V.	—35
P.L.	20.3	...	...	...	
P.I.	8.5	N.P.	N.P.	N.P.	—6
"R" Value	82	86	86	85	+65*
Sand Equiv.	24	49	54	49	+30*

*Not specified but considered for design purposes.



ASPHALT SWIMMING POOLS provide large swimming areas at low cost. Their excellent weathering qualities are based on asphalt's resistance to pressure, freeze-thaw, chlorine, and abrasion. Asphalt wading pools serve equally well as skating rinks.

ALL-SEASON TENNIS COURTS paved with asphalt are fast, true, unaffected by frost, and can be played on immediately after rain.

RESILIENT PLAYGROUND PAVING of asphalt answers the need for a smooth, hard surface which can be used year-round in all kinds of weather. Fewer injuries occur on asphalt than on untreated earth or loose aggregates. Maintenance is negligible.

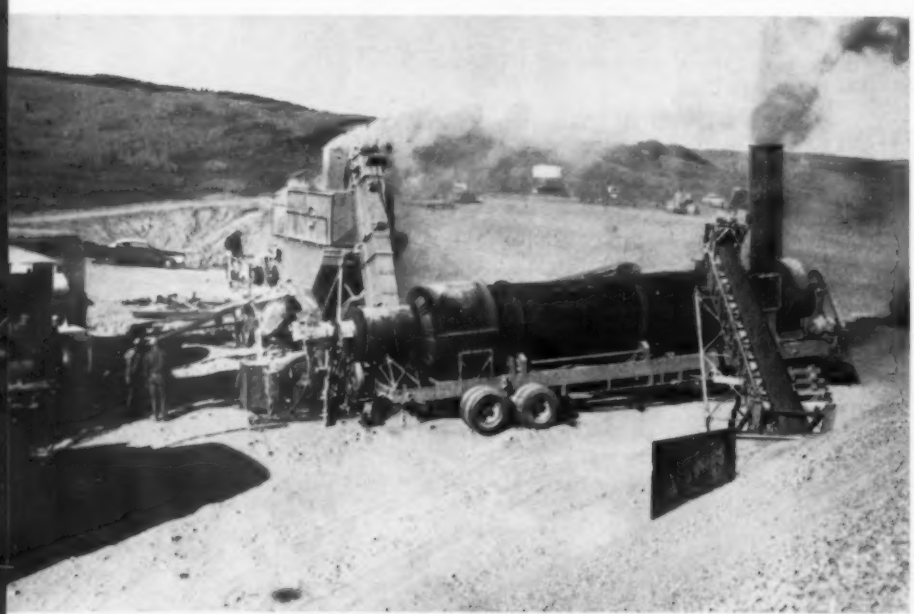
ASPHALT FROM ESSO
OPENS THE WAY TO LOW-COST RECREATION

Asphalt from Esso gives motorists a smooth, comfortable ride on many of the nation's best roads. It also plays a big part in meeting the growing need for recreational facilities. In both fields, asphalt is saving money for taxpayers.

Esso refines asphalt in a wide range of grades to suit a variety of recreational and other purposes; delivers it from nine conveniently located supply points so you can always get prompt deliveries. For technical information about this economical and versatile material, write us at 15 West 51st Street, New York 19, New York.

ESSO STANDARD, DIVISION OF
HUMBLE OIL & REFINING COMPANY

Muddy Pass project. Bulk tanker, 5-inch feeding screw and hopper introducing lime into the dry mix. On far side, reject belt from the screens. In this plant set-up, aggregate is fed to the dryer by belt.



More complete view of plant shown on first article page. Lime feeding setup seen at left. T55 TPH hot-mix plant for Muddy Pass project.

COLORADO UPGRADES

Continued from page 116

its. Lime also served as a void filler, as noted by the increased specific gravity of the mix and the decrease in percent voids.

The above improvements with lime can be considered typical with many of the plastic gravels in Colorado. In some cases, however, the results are even more impressive, e.g., the W/D ratio of the lime-treated specimen often exceeds 100/100, indicating an actual strength gain during soaking. Furthermore, some untreated cylinders may slake during the soaking period or show a W/D ratio as low as 11/100; yet after lime is added, the ratio generally exceeds the 75/100 specification.

Evidence of lime's effect on volume change with the materials tested can be seen in one of the accompanying photographs. This shows a lime-treated cylinder made with 6.2 percent asphalt, and an untreated cylinder made with 5.5 percent asphalt after 4 days immersion. In the untreated specimen, the swell was great enough to cause considerable cracking. This illustration, along with Tables 1 and 2, shows how lime permits more asphalt to be used in such mixes without resultant loss in stability. As asphalt technologists point out, the more asphalt you can use without the overfilling of voids, the greater the water resistance and the longer the pavement life.

Muddy Pass Projects

The SH 14 job was located in North Park, 17 miles south of Walden, at a mean elevation of about 8400 ft. It involved the paving of an existing gravel road, with the overlay comprising a 4-in. thick subbase of 2-in. gravel, a 4-in. depth of base of ¾-in. gravel (26 ft. width), and a 2-in. asphaltic mat (22 ft. width).

The US 40 job east of Muddy Pass elev. 8,772 ft. at the (Continental Divide), involved the reconstruction of a worn-out asphalt pavement. In this case the in-place base and pavement material was reclaimed and sweetened with ¾-in. nominal size gravel, followed by stabilization to a 6 in. depth with 3 percent of cement. The pulverization of the salvaged material was accomplished with a traveling rock crusher, and a Pulvimixer was used in the mixing and watering operation. The base was topped with a 2-in. asphalt mat, 30 ft. width, with a painted edge marking 4 ft. in from the pavement edges, making in essence 11-ft. driving lanes and 4-ft. shoulders.

On both jobs the asphalt mix design comprised 6.6 percent asphalt cement (200/300 penetration), 1 percent hydrated lime, and 92.4 percent gravel (based on dry weight.) This amounted to 20 lb. of lime per ton of hot mix, or about 2 lb. per sq. yd. of pavement. The top course surfacing gravel was processed to meet the state's specification for Modified "C" Grading. Below is the typical gradation, including the 1 percent lime additive (which contained more than 90 percent passing 200 mesh).

	Passing	Specifications
¾ in.	100	100
½ in.	92	
⅜ in.	78	

Continued on page 122

Designed for maximum payload ...the new Etnyre model FX-500!

Talk about payload! Compare these Etnyre capacities to *your* state load limits: 1550 gallons for single 18,000# axle
1690 gallons for single 20,000# axle
1840 gallons for single 22,400# axle

You can count on similar greater maximums on semi-trailer single and tandem axle mountings too! And dependable operation, and uniform, accurate distribution are always typical of the results you can expect from an Etnyre. Look at the sharp, clean edges and the even distribution in the above photo of an Etnyre FX-500 and you can see the results of Etnyre's exclusive triple-lap coverage.

OTHER FX-500 QUALITY FEATURES:

• Hardened aluminum jacketing over 2" Fiberglas insulation which is reinforced with molded asbestos blocks • Stainless steel jacket near burners and exhaust stacks • Stainless steel heat jacket for pump • Aluminum fenders and mud flaps.

You're familiar with Etnyre's accuracy and dependability . . . now you can get maximum payload too . . . for maximum profit. Investigate today — find out how a "Black-Topper" can handle more work . . . faster . . . better . . . more economically. E. D. Etnyre & Co. Oregon, Ill.

SEE YOUR ETNYRE DEALER

ETNYRE
"Black-Topper"
BITUMINOUS DISTRIBUTORS

. . . for more details circle 302 on enclosed return postal card

IT'S NEWS!

The New Mixing Grades Cationic Bitumuls

WESTERN UNION

TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS
DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

OC110
SSD217 O SFE278 NL PD SAN FRANCISCO CALIF MAR 15
HIGHWAY ENGINEERS
EVERYWHERE

HEAVY BLACK BASE MIXED, LAID AND OPENED TO TRAFFIC IN EIGHT HOURS---REPEAT EIGHT HOURS---ACCORDING TO JOB REPORT. NEW MIXING GRADES CATIONIC BITUMULS IS KEY TO SPEED. CALL OUR NEAREST OFFICE FOR COMPLETE INFORMATION

AMERICAN BITUMULS & ASPHALT CO.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

Daily Construction Journal

NEW MIXING GRADES CATIONIC BITUMULS CUTS HOURS FROM ROAD BASE JOBS

Nationwide Reports Stress Speed of Construction

Base mix cures fast, permits rapid compaction after blading.

Contractor Terms It "Instant Paving"

SAN FRANCISCO, CALIF.—Job reports on base construction using the new Mixing Grades Cationic Bitumuls have now been received here at company headquarters from jobs nationwide.

Initial reaction among engineers and contractors connected with these jobs has been surprisingly uniform: all are impressed with the speed and ease of base construction using this new material. One contractor is reported to have used the term "Instant Paving" when referring to the base mix prepared with the new Mixing Grades Cationic Bitumuls.

This new product, developed by American Bitumuls & Asphalt Company, readily coats a wide range of aggregates—including many that are normallly considered "difficult". The mix is prepared in simple, high-capacity equipment, and can be spread and compacted immediately. There is no delay for aeration.

"BETTER ROADS, FASTER"

Company engineers sum up the advantages of Mixing Grades Cationic Bitumuls in these few words: "Gives you better roads, faster." Every job report to date bears out this brief statement. Such terms as "better adhesion in the presence of water"; "improved early cohesion of the compacted mixes"; "better mixing properties due to fluidity", are frequently used in these reports as reasons for faster, better road construction.

Company Offers Data On New Mixing Grades Cationic Bitumuls

American Bitumuls & Asphalt Co. will welcome inquiries regarding the new Mixing Grades Cationic Bitumuls. Information on this new material is available from the locations shown, right.

Drag Strip Built in Five Working Days

PANAMA CITY, FLA.—The rapid mixing and placement of a sand mix base, stabilized with new Mixing Grades Cationic Bitumuls, was credited with speedy construction of an automotive drag strip near here recently.

The installation, a private project, was started on Wednesday. Preliminary clearing and grading were followed immediately with the mixing operation. Using a travel mixer, windrows of native sand were treated with new Mixing Grade Cationic Bitumuls; the mix was spread, compacted and opened to construction traffic immediately. On Friday, just two days later, this base was given a conventional sand seal and the strip was ready for operation.

Contractors on the job were reported as "impressed" with the ease and speed of the operation; and with the fact that occasional showers during the base mixing operation had no visible effect on the quality of the mix.

Laboratory Wash-Tests Prove Early Set Of New Mixing Grades Cationic Bitumuls

These two photos taken in the laboratory of American Bitumuls & Asphalt Co., demonstrate the "holding power" of the new Mixing Grades Cationic Bitumuls.

In the above photos you see the results of this test: the stone coated with the anionic binder is on the left; that coated with the Cationic binder on the right. Note the complete coverage maintained by the Mixing Grade Cationic Bitumuls.

American Bitumuls & Asphalt Company

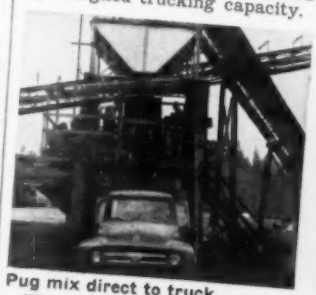
320 MARKET ST., SAN FRANCISCO 20, CALIF.
Perth Amboy, N. J.
Baltimore 3, Md.
Cincinnati 38, Ohio
Atlanta 8, Ga.
Mobile, Ala.
St. Louis 17, Mo.
Tucson, Ariz.
Portland 8, Ore.
Oakland 1, Calif.
Inglewood, Calif.
San Juan 23, P. R

BITUMULS® Emulsified Asphalts • CHEVRON® Paving Asphalts • LAYKOLD® Asphalt Specialties • PETROLASTIC® Industrial Asphalts

Cuts Traffic Tie-Up With Quick-Set Mix

EUGENE, ORE.—On a short heavily-traveled section of a major highway outside of Eugene, Oregon, engineers specified construction of a four-lane divided pavement with a minimum of traffic tie-up. They authorized the contractor, Wildish Construction Company, to use the new Mixing Grades Cationic Bitumuls for quick-setting Black Base construction that could be opened to traffic before it was surfaced.

Using a good quality graded aggregate (100% passing ¾"; 5% passing #200 mesh) the contractor prepared the base mix in a central plant using a simple pug mill. Rate of mix production (about 400 tons/hr.) was limited by assigned trucking capacity.



Pug mix direct to truck

The cold-prepared mix was trucked to the job in a fleet of bottom-dumps; bladed to grade; then compacted. It was opened to traffic the following morning while work was continued on the lanes across the dividing strip.

In reporting on the job, the Project Engineer stressed the good workability of the Cationic mix, plus the speed and ease of lay-down.

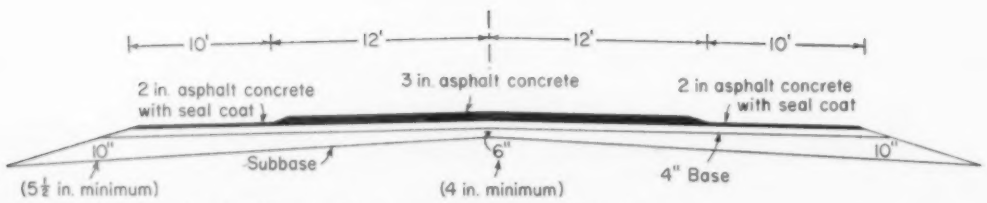
Cationic Bitumuls Stockpile Mix

Development of the new Mixing Grades Cationic Bitumuls has made possible, in some areas, the production of a patching and maintenance mix that can be prepared in advance; stockpiled until needed. The new Stockpile Mix retains good workability yet sets up readily after placement and compaction under traffic. This mix uses selected graded aggregates. Details are available from Company headquarters.

Showing typical poorly sorted gravel found in pits for the Gunnison US 50 project. Shovel is feeding a Cedarapids Commander portable crushing and screening plant.

Two test cylinders made with the same aggregate and 85-100 asphalt, shown after four days' immersion. Upper: specimen containing no lime and low percent asphalt, cracked due to swell. Lower: lime treated specimen remained firm.

A rock picker had to work overtime here, rejecting boulders ahead of the crusher. No primary unit used; only a secondary jaw and double roll. Clay fines constituted a problem, for which lime additive was employed.



Cross-section of paving for US 50 project east of Gunnison, Colorado.

COLORADO UPGRADES

Continued from page 119

	Passing	Specifications
4 mesh	56	45-60
10 mesh	44	35-50
40 mesh	21	
100 mesh	12	
200 mesh	9	5-10
Liquid Limit	N.V.	30
P.I.	N.P.	6

Originally, the mix design incorporated 3 percent pulverized limestone as the additive; however, 1 percent hydrated lime was found to be more economical and provided greater improvements. In this particular case, the two materials originated from the same source, and delivery costs were necessarily high due to a long haul over mountain roads. Even though lime had a higher unit price than pulverized limestone, there was actually a 50 percent savings in using 1 percent lime over 3 percent limestone.

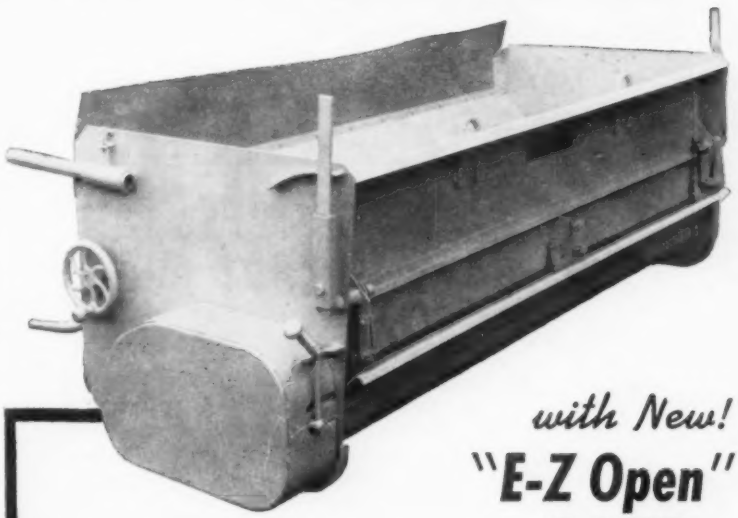
All subbase, base, and surfacing materials for both jobs were obtained from the same pit located adjacent to SH 14. The gravel was excavated with a 2-cu. yd. dragline and processed in a Cedarapids portable crushing and screening plant. Principal plant equipment included a hopper with grizzly, 36-in. reciprocating feeder, 4 x 14 ft. triple-deck screen, 12 x 36 in. twin jaw crusher, and 30 x 25 in. roll crusher.

The hot mix material was produced at a 155 tph rate in a Pioneer 81 continuous portable plant. Aggregate was obtained from stockpile via a 30 in. apron feeder mounted in a reclaiming tunnel. A Cat D6 tractor, fitted with a U-dozer, worked with the stockpile. A 20-in. portable belt conveyor fed the 7 x 25 ft. drier, which was operated at 250-275°F. An interesting feature was the use of liquid butane which was injected at 40 psi into the drier without being preheated. After drying, the material was screened on a 4 x 8 ft. double-deck unit fitted with ¾ in. and No. 4 mesh openings. Oversize was wasted via a reject conveyor, and the two gravel sizes dropped to separate bins. A 30-in. apron conveyor was then used to feed the aggregate to the bucket elevator serving the pug mill.

Hydrated lime, from Basic Chemical Corp., Glenwood Springs, was delivered in bulk tanker trucks carrying 16-ton loads. It was unloaded by a 5-in. screw conveyor into a belt feeder, which discharged the lime into the hot aggregate elevator. To keep the lime from clogging in the 500-lb. capacity hopper, the contractor equipped it with a rotating agitator driven off the 12-in. feeder belt. For best results the feeder was operated at a slow rate—12 ft. per min.

The 200/300 grade asphalt was stored in an 18,000-gal. tank, and heated to 300°F. The recirculating oil used to heat the asphalt tank and piping was maintained at 350° F. automatically. Asphalt was introduced into the twin pug mill at 30 psi, and the hot mix was discharged into a 1 cu. yd. hopper fitted with air-operated gates. The asphalt pump and lime and aggregate feeders were electrically inter-

SPREAD CHIPS FASTER, EASIER!



with New!
"E-Z Open" GATE

STANDARD STEEL'S new spreader with all these features:

- Simple, low maintenance chain transmission
- "E-Z Open" gate swings away from box, carries no load
- Heavy duty, positive locking truck hitch
- Heavy double-grooved feed roll
- 0 to 2¾" full or tapered spread
- Available with one man control, cut-off plates, agitator, platforms

See your dealer or write for literature.

OTHER PRODUCTS OF STANDARD STEEL
ASPHALT DISTRIBUTORS . . . BURNERS . . . POWER AND TRACTION DRIVEN CONSTRUCTION BROOMS . . . MAINTENANCE DISTRIBUTORS . . . TAR KETTLES . . . AGGREGATE SPREADERS STREET FLUSHERS . . . PIPE LINE EQUIPMENT . . . SUPPLY TANKS SHELVING HARDWARE . . . AND AGRICULTURAL EQUIPMENT

Built to The Highest Standard

Standard Steel Works, Inc. NORTH KANSAS CITY, MO. G5-157

. . . for more details circle 346 on enclosed return postal card

Solve Your Patching and Repairing Problems with *McConnaughay* HTD MIXERS

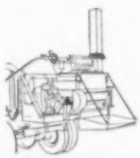
NO OTHER MIXER CAN DO ALL THESE THINGS

You can use a McConnaughay Mixer to reactivate and heat stock pile mixtures... prepare cold asphaltic mixtures... prepare hot asphaltic mixtures... dry various types of wet aggregates quickly, thoroughly... remove *both* moisture and solvents from bituminous mixtures... produce bituminous mixtures with tars, paving asphalts, cut-back asphalts, and emulsified asphalts. McConnaughay Mixers operating under U. S. Patent No. 2,626,875, are authorized to mix emulsified asphalt and aggregates in the presence of flame and heated gases. Write for our folder on the complete line of McConnaughay Asphalt Patching Mixers as well as for specifications and proportioning tables.

HTD MIXER No. 10
½ ton per batch

HTD MIXER No. 8
½ ton per batch

HTD MIXER No. 5
¼ ton per batch



HTD MIXER No. 4-T
⅓ ton per batch

McCONNAUGHAY MIXERS, INC.—LAFAYETTE, IND.

National distributors: Asphalt Equipment Co.
3314 Cherry Lane, Fort Wayne, Indiana
Export Representative: William H. Schuelie, 440 E. 79th St., New York 21, N. Y.

. . . for more details circle 339 on enclosed return postal card

locked, so that breakdown of any unit would automatically stop the operation.

Paving was handled with a new Cedarapids bituminous paver-finisher, having a maximum travel speed of 102 fpm; power was provided by a Cat D311 diesel engine, especially adapted to high altitude work. Pavement laydown widths were 10 ft. on the US 40 jobs, and 11 ft. on the SH 14 job. The breakdown rolling and final compaction of the 2-in. mat was accomplished with a 10-ton tandem steel roller. The specified 95 percent density was readily attained with a minimum of passes. The hydrated lime additive seemed to aid compaction, and permitted the rolling to start shortly after the laydown operation.

Principal job quantities on the two projects were as shown in Table 3.

Key men involved in the Muddy Pass projects were Wendell Galbraith, superintendent, C. L. Hubner Co.; Fred Rose, plant operator; Frank Curry, foreman; Ralph A. McCoy, C.H.D. district engineer; H. A. Demarest, construction engineer; Robert E. Heathcote, resident engineer; James R. Hall, project engineer; and Keith White, principal engineering technician.

Gunnison Project

The US 50 job, in the Gunnison River valley, involved considerable realignment, grading, and bringing the existing road up to full geometric standards for Colorado's high-type "B" pavement. Sketched here is the typical section. Note that the subbase built with 2½-in. gravel utilizes the "haystack" design, being 4 in. thicker at the shoulders than at the centerline; on this job most of the subbase varied from 6 to 10 in. thick. The base, consisting of ¾ in. gravel, was 4 in. thick, and the pavement comprised 2-in. thickness of asphalt shoulders and 3-in. of asphalt on driving lanes.

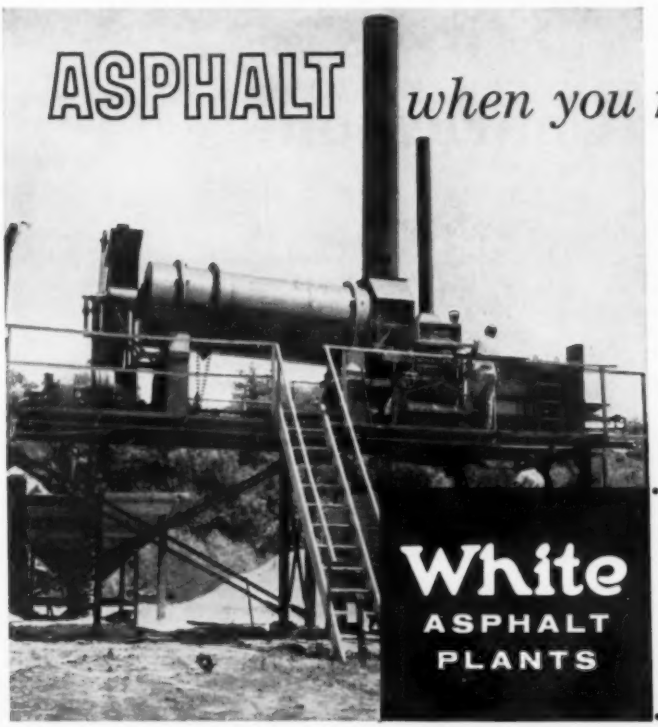
As at Muddy Pass, a local gravel pit provided all base and paving materials. However, here the gravel was unusually plastic (P.I. of 8-10), although the Resistance (R) value was 80-82, adequate to meet the design criteria. To reduce the P.I., the highway department resorted to lime stabilization, using 1 percent lime in all paving courses. This is

At Muddy Pass job, pugmill loading trucks with lime treated hot mix. Lime feeding screw conveyor glimpsed at right, reject belt at left.

Completed job on US 40 east of Muddy Pass. Lime-treated asphalt concrete placed 2 in. thick and 30 ft. wide, with markings for 4-ft. shoulders.

believed to be the first U.S. project in which lime was used in both base stabilization and in asphalt paving. The principal alternate to stabilization would have involved the scalping off of the plastic fines, and the use of a primary crushing plant to manufacture the necessary fines, from the bouldery deposit. This would have proved more costly than stabilization, since the latter permitted the use of a secondary crushing plant only, with the larger boulders being scalped off and all the natural fines being utilized.

An indication of how lime upgraded the gravel can be seen in Table 4, which shows both the preliminary tests of stockpiled subbase material and tests of field subbase



With a low cost *White* asphalt plant of your own, you meet deadlines easily . . . get jobs you wouldn't otherwise have. The reason is, you get your mix when you need it—and for lots less than you would have to pay someone for it. No long hauls, either. Costs stay down where they belong. Profits go up . . . enough to pay for your asphalt plant in a season or two. You produce AC, RC, MC, SC or emulsified for top course, one course, or patch. Supply black-top for suburban streets, drives, parking lots, school yards, and state highway maintenance. See your nearest *White* dealer or . . .

send coupon direct to us

White Manufacturing Company, Elkhart 2, Indiana
Please send me information about White low cost asphalt plants.

name

address

city and state

. . . for more details circle 353 on enclosed return postal card

samples. The latter indicates that the improvements shown in the lab were matched in the field.

As on the Muddy Pass Jobs, the gravel was processed in a portable Cedarapids secondary plant, and the hot mix produced in a portable Pioneer continuous plant. The gravel was excavated with a 2 cu. yd. shovel, and delivered to the crushing plant via reciprocating feeder and 36-in. belt conveyor. To eliminate the large amount of boulders, the contractor installed a rock picker over the primary belt, which was set to reject plus 6-in. material.

Mixing of the lime with the subbase and base material was handled by a Barber-Greene twin pugmill; the unit was actually taken off a travelling road mixer and mounted as a portable plant. The lime was used in bag form, the lime being dumped into a 50-gal. oil drum, then taken by screw conveyor to a 14-ton bin. It was then fed at a constant rate via a vane feeder and screw conveyor to the portable aggregate belt conveyor serving the pug mill. To prevent dust loss, the conveyor was equipped with 12-in. side boards. After mixing, the treated aggregate was dumped in windrows and laid in thin lifts with the grader. Because lime made the material non-plastic and friable, the laydown operation proceeded easily. Compaction was handled with vibrating and self-propelled pneumatic rollers. Prior to paving, the base was primed with MC-O applied at a rate of 0.37 gal./sq.yd.

In the hot mix operation, 1% lime was introduced at the hot aggregate elevator serving the pug mill, similar to the Muddy Pass plant setup. The same lime handling facilities were used as in the base stabilization plant, except that a belt conveyor was added to transfer the lime from the screw feeder to the hot elevator. Another variation from the stabilization plant was the use of bulk lime instead of bags, the bin having the capacity of one tanker truck load.

On the Gunnison job, ¾-in. gravel, sized to Grading C specifications, was used in the hot mix (100% passing ¾ in.; 45-60 percent No. 4; 30-45 percent passing No. 10; and 5-10 percent passing No. 200). The paving was handled with a Barber-Greene unit, first laying a 2-in. mat across the entire roadway (shoulder to shoulder), then a 1-in. mat across the 24-ft. driving surface. Even though ¾-in. gravel was used, there was no trouble in laying the relatively thin top wearing course, since the lime additive made the hot mix fluffier. To achieve a 1-in. compacted layer, it was necessary to lay about 1½ in. blanket. Two tandem steel rollers were used for compaction.

Principal job quantities on the Gunnison project were as follows:

Subbase (Class 1)	24,000 tons
Base (Grading C)	15,900 tons
Asphalt (120/150)	710 tons
MC Prime	31,700 gals.
RC Seal	7,900 gals.
Stone screenings (shoulders)	400 tons
Hot mix	10,580 tons
Hydrated Lime (1% of 3 layers)	505 tons

The entire Gunnison project, including grading, stabilization, and hot mix paving, was handled by Colorado Construction Co., Denver. Jack Edwards was superintendent; Charles Edwards, plant foreman; Kenny Fowler, mechanic; S. Samuelson, paving foreman; and Nick Kohler, superintendent of grading and base construction.

Principal Colorado highway department engineers involved were Ralph A. McCoy, district engineer; Homer Gray, construction engineer; Lloyd House and Norman Coombe, resident engineers; Frank J. Andrews, project engineer; and Albert Davis, principal engineering technician.

With AAPT at Charleston

Sixteen papers and a panel discussion of "Asphalt Bound Bases" made up the annual meeting of the Association of Asphalt Paving Technologists, held February 6-8 at Charleston, South Carolina.

Compaction, and the correlation between laboratory results and field data, was the subject of two papers. Kimble and Gibboney presented density and stability data on representative samples compacted by the Ohio gyratory machine, and compared the density data with cores from existing pavements, taken after both construction and later use. The traffic consolidation corresponded to a relatively low gyratory compactive effort, generally far below the maximum consolidation possible before developing decreasing stability.

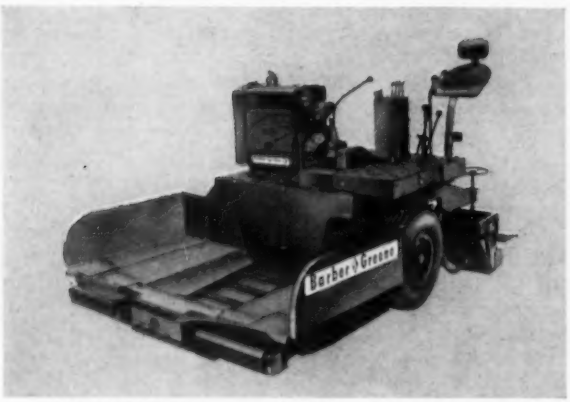
Rutting vs, Stability Values

Campen, Smith, Erickson and Mertz presented data on Omaha city pavements. Their results indicated that the field densities after several years of use were approximated by those obtained in the Marshall design procedure. However, observations on both the tendency to rut under critical conditions, and pavement wear, did not correlate too well with Marshall stabilities. Such correspondence as might be pointed to would at the same time indicate a much smaller permissible variation in this value than the usual specifications or experience elsewhere would indicate; and the differences noted could be much better explained by aggregate and asphalt film thickness changes.

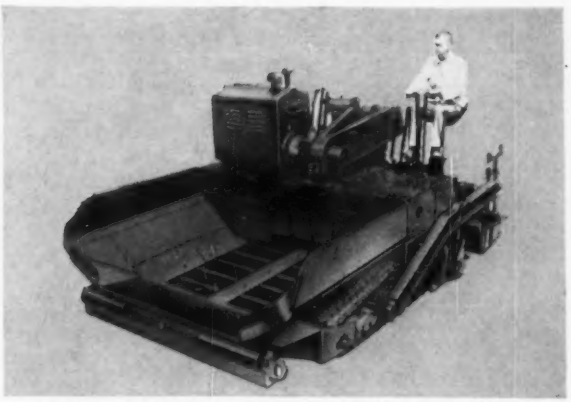
Asphalt Change in Use

The basic changes in asphalt occurring with use were the subject of two papers. Jimenez and Gallaway reported on the trends shown by tests on asphalt after service, reporting data which with other information should eventually result in tests from which the binder durability should be predictable. They also had some pertinent comments on design and construction practices. Traxler discussed the first stage

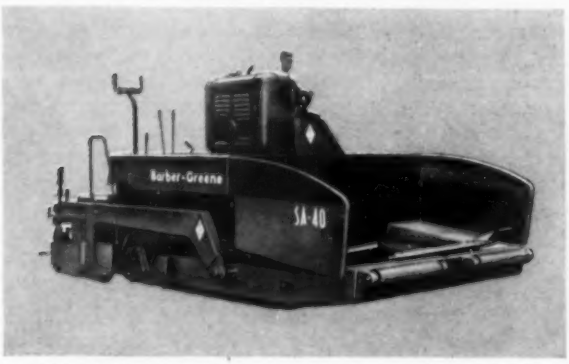
Continued on page 128



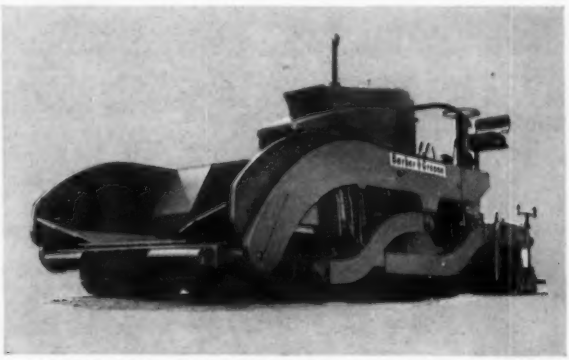
873 FINISHER—Compact, highly mobile for variety of scattered jobs. Paves on crawlers. Travels on rubber.



879-B FINISHER—Economy model in the general duty paving range.



SA-40 FINISHER — New general duty model is big advance in modern asphalt paving equipment.



SA-60 AND SB-60 FINISHERS—Ultimate in heavy-duty, high speed, high capacity, low maintenance asphalt paving. SA-60 is crawler mounted, SB-60 is pneumatic tired.

Barber-Greene's No.1 finisher line offers broadest choice, biggest values

Barber-Greene offers you the world's broadest selection of asphalt finishing machines—three sizes in five models—for most profitable equipment use. In addition, the versatile SJ-50 Road Widener-Shoulder Paver handles both asphalt and concrete with interchangeable attachments.

And here are reasons why each machine tops its class for performance and value:

- **Lowest paving cost per ton.**
- **Greater paving speed.**
- **Highest quality mat obtainable through tamping-levelling principle with compaction before strike-off.**
- **Easiest, most positive control.**
- **Self-cleaning hopper design cuts hand labor.**
- **Unobstructed visibility to hopper, spreading screws, joints or road edge, and truck.**
- **Operators' preference boosts productivity.**
- **Proved ability to lay all types of mix.**
- **Industry's finest parts and service support.**

Get your best deal from the man who sells the most asphalt paving equipment in your area.

World's No. 1 Manufacturer of Asphalt Paving Equipment

Representatives in Principal Cities of the World

Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U. S. A.
Other Plants: DeKalb, Milwaukee, Detroit, Canada, England, Brazil, Australia

CONVEYORS • LOADERS • DITCHERS • ASPHALT PAVING EQUIPMENT

. . . for more details circle 287 on enclosed return postal card

NEVITT

Continued from page 126

results from an interesting investigation of hardening tendencies, showing that high (mixing) temperature hardening resulted in composition changes. His data indicate that oxidation is an equal or larger factor in this hardening than volatilization in the asphalts studied. Also that composition not only changes in the process but that it likewise may serve as an indicator of the rate of hardening to be expected, at least in usual asphalts.

The general subject of structural strength or stability was touched on by several papers. Douglas and Tons investigated this property for bituminous mastic concrete (essentially high filler content voidless mixtures), studying a typical gussaphalt such as is now being widely used in Germany. Their data show values superior to normal asphaltic concrete mixes: they conclude these are the result of the asphalt film characteristics. Davis reported upon the possibilities of the cone penetrometer for measuring the stability of fine grained (or sand) mixes, concluding that this simple approach had great possibilities for both design and control purposes. Heithaus and Izatt outlined the factors which influence Marshall Stability values and their relative effects.

Monismith, Secor and Blackmer reported on their continued valuable work in the field of repeated flexure. They repeat their earlier findings that asphalt content intimately influences fatigue resistance as does likewise the magnitude of the pavement deflection—but this, as pointed out in discussion by Carpenter, is more determined by the total structure characteristics than the asphalted layer stiffness. He could find no difference in results from two quite different asphalts—which did not, however, represent the usual variation in the binders—nor from the introduction of reverse flexure in the test. This paper contains a valuable review of the literature on the effects of strain on pavement failure.

Materials, Including Fillers

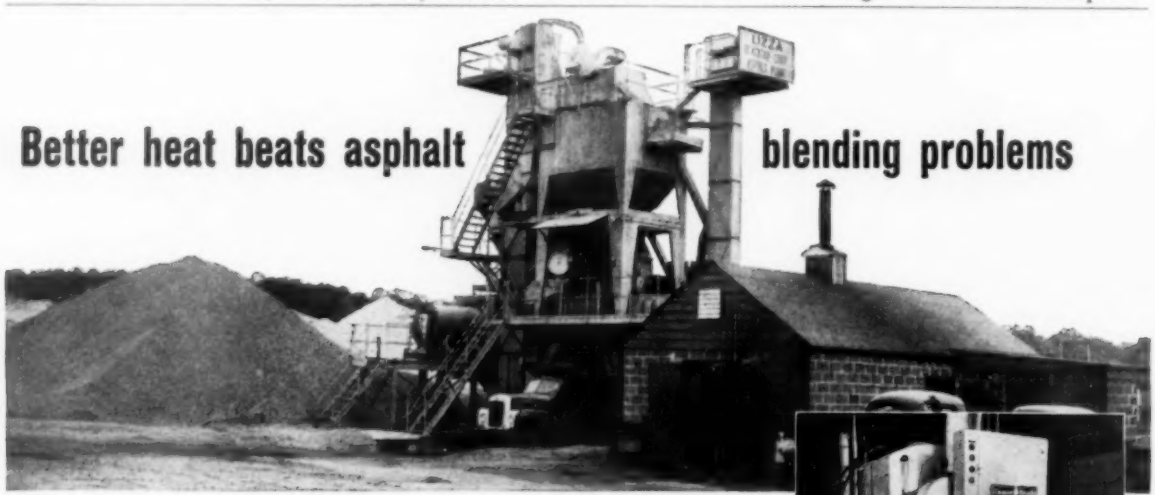
Materials received their share of attention. Wedding and Gaynor reported on the relative influence of using crushed versus uncrushed material in both the coarse and the fine aggregate fractions, showing that the Marshall stability was appreciably improved by utilizing up to 75 percent of crushed material in the coarse fraction, but the benefits from crushed sand were far less. (Designers and specification writers should note that there was no benefit beyond this percentage).

Discussion brought out that this latter finding did not agree with past investigations, and raised the question as to whether the sand used in this particular investigation might not be a superior material in its natural state.

Kallas and Puzinauskas gave extensive data on a number of fillers, covering not merely the filler properties and some filler—mortar tests but likewise those on a typical paving mix containing a constant filler volume, but refrained from specific conclusions as to which would make the superior pavement in practice. Fillers still remain a subject of some mystery, as their relative rating by the various approaches that have been given in the literature is often radically different.

Design and construction practi-

Better heat beats asphalt blending problems

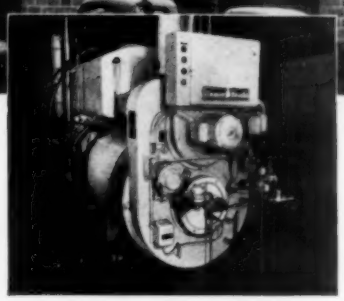


Lizza Asphalt Construction Company, Oyster Bay, Long Island, cuts maintenance costs, gets top performance blending asphalt into black-top paving materials with Cleaver-Brooks Peak-Temp oil heater.

Heating 10,000 gallons of asphalt a day has been a lot easier for J. W. Slawson, superintendent of Lizza Asphalt Construction Company, since the installation of a Peak-Temp oil heater, Model CPT 500-12, in March, 1958.

"We don't have to worry about overtime costs," says Mr. Slawson. "The fully automatic operation of this heater, plus low-pressure operation, keeps manpower requirements down. Maintenance is low, and our records show operation is efficient. The unit has run continuously (more than two years) without appreciable trouble."

For safe, low-pressure operation and continuous, automatic heating to 480F, Peak-Temp has proved itself to be the economical solution to construction material and process heating problems. For details, write Cleaver-Brooks, Dept. D-395 E. Keefe Avenue, Milwaukee 12, Wisconsin.



Cleaver Brooks®

ORIGINATOR AND LARGEST PRODUCER OF PACKAGED BOILERS

...for more details circle 295 on enclosed return postal card

ces received some attention. Sebastyan outlined the evaluation procedures adopted by the Canadian Department of Transport, with a valuable discussion of Canadian experience that should interest every designer of airports or asphalt pavements. Lottman reported on the characteristics of asphalt plant dryers, giving some valuable practical data. His study clearly brought out the effect of particle size on the internal particle temperature, with its serious implications where the aggregate contains internal moisture. Another paper on drying by Sonderegger outlined the investigative difficulties inherent in a study of permissible moisture contents in aggregate and gave some preliminary findings of great interest. These indicate that the effect of moisture in the aggregate is not merely dependent upon the amount present but upon other factors, particularly the aggregate gradation and the laying conditions, both of which markedly affect the escape of this moisture as it is volatilized from the hot mix. While the subject requires more study, considerable doubt is thrown on many current specifications with limits set either quite high or quite low.

Mixing Research

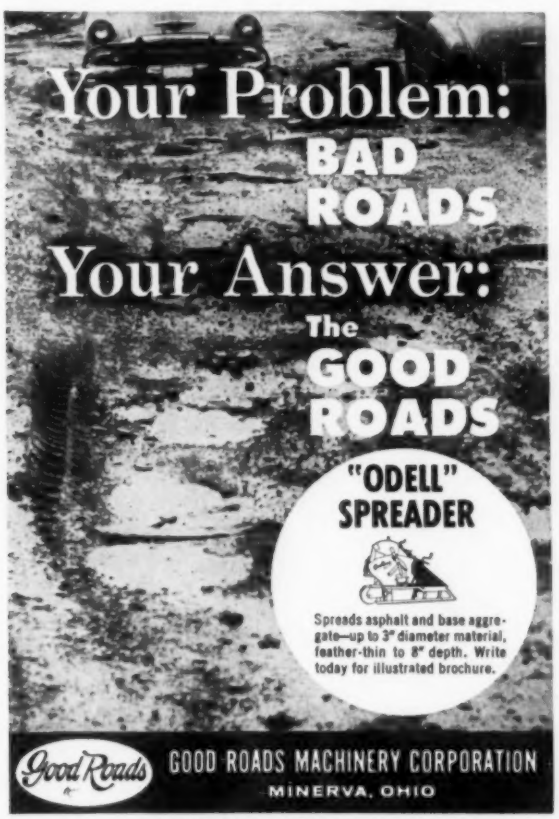
Warden, Ward and Molzan gave a further report on the Ross Count method of determining coating effectiveness in the mixing operation, showing that the data on the mix investigated could be easily analyzed and the test results duplicated with considerable accuracy. This indicates that the pressing need for a proper evaluation of the mixing time required in asphalt plants can perhaps be met by some more intensive investigations of this type.

Viscosity measurement was the subject of two papers. Schweyer and Bransford reported data with the sliding plate viscometer, which indicate that film thickness below forty microns may appreciably influence the viscosity reading. That fine dirt particles must be eliminated from the asphalt was brought out in the discussion but not conclusively shown to be the cause. There are many who question the accuracy of this instrument with quite thin films, while agreeing upon its utility in connection with other tests such as heat hardening and that it an furnish valuable comparisons regardles of whether the findings reported are correct absolute values. Goodwin reported on a study of viscosity methods for practical control purposes, giving essentially the precautions needed for accuracy with the Brookfield syncroelectric viscometer and the conclusion that it can be used advantageously for rapid control testing—preferably in the shipping container of cutbacks, though suggesting that the Saybolt instrument be used for the final test where the Brookfield results indicate off-specification material.

Asphaltic Bases

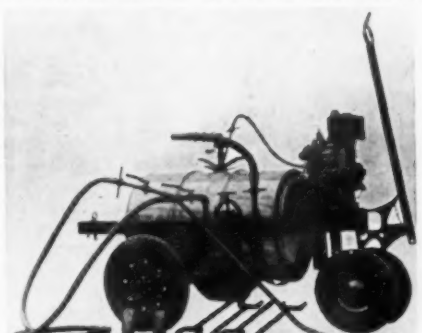
The symposium on Asphalt Bound Bases (excluding asphalt soil stabilization) brought out many interesting points in the preliminary remarks from the panel members and the floor discussion. Foster emphasized the need for more accurate information—which he thought should come from rolling traffic tests—on the comparative structural value of black bases as compared to the usual types. He stressed the need for proper asphalt

Continued on page 174


Your Problem:
BAD ROADS
Your Answer:
The GOOD ROADS
"ODELL" SPREADER
Spreads asphalt and base aggregate—up to 3" diameter material, feather-thin to 8" depth. Write today for illustrated brochure.
Good Roads
GOOD ROADS MACHINERY CORPORATION
MINERVA, OHIO

. . . for more details circle 314 on enclosed return postal card

BARREL SPRAYER



Tarco "Direct from the Shipping Drum" Sprayers are **rugged,** simple-to-operate liquid spraying machines.

MATERIALS HANDLED: **Bituminous Binders:** asphalt emulsions, light cutbacks and tars. **Concrete Curing Materials. Weedkillers. Cleaning Solvents. Paint.**

SPRAY WORK: **Build and Repair Pavements. Cure Concrete. Kill weeds. Clean and Paint** equipment, buildings, etc.

You Save Time, Labor, and Materials when you spray right from the barrel.

See your Tarco Dealer or write for complete details

TARRANT MFG. CO.

25 Jumel Place, Saratoga Springs, N. Y.

. . . for more details circle 351 on enclosed return postal card

NEW PRODUCTS

Listed here are reviews of new and improved equipment items, selected to aid our readers in purchasing. See reader service numbers on enclosed postcard.*

P.H's 500 Series—Magnetorque Swing System and Stable Crawlers.

Crawler-Mounted Excavator-Cranes

Three crawler mounted excavator-cranes, reported capable of handling 70 percent of user job requirements has been announced by Harnischfeger Corp.

The three machines make up the new "500 Series", the P&H Models 525, 535, and 550. Basic excavator rating is 1¼ cu. yd. Lifting capacities range from 25 tons with the 525 to 50 tons with the 550. The 535 operates as backhoe with excellent depth and reach, or with crane-dragline-clamshell attachments. Rated at 35 tons with a 40 ft. T-1 steel boom, it handles main boom-job combinations up to 140 ft. long. Mounted on long crawlers, the P&H 535 is reported to have excellent floatation in soft footing. Largest of the group, at 50 tons capacity, is the 550. With maximum 150 ft. main boom and 50 ft. jib, it can deliver materials as high as 20 stories above ground. Wide, long crawlers are standard equipment, giving stability for work as a powerful erection crane, 80 ft. clamshell, 70 ft. dragline or backhoe reaching almost 43 ft. All three machines are equipped with Harnischfeger's Magnetorque swing system which transmits and controls power electro-magnetically, rather than by fiction clutches.

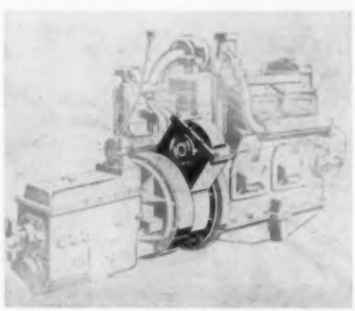
Construction & Mining Div., Harnischfeger Corp., 4445 W. National Ave., Milwaukee 46, Wis.

For more details circle 101 on Enclosed Return Postal Card.

Flywheel PTO

A new flywheel power take off unit which can deliver 200 hp. directly from engines rated up to 400 hp. can eliminate costs of auxiliary engines and "serviced-heavy" shafts for many PTO configurations.

The heavy-duty flywheel PTO, designed by Cotta Transmission Co., mounts independently between engine flywheel and master clutch. Power can be taken off even when clutch is disengaged. Cotta's spacer PTO increases versatility of heavy construction equipment, generators, auxiliary hydraulic equipment and air compressors. Compact unit adds only 12¼ in. to power train length. Simple installation adapts this flywheel PTO to any gasoline or diesel engine. No alterations are required for other power train components. Standard mounting—front and rear—is provided by either SAE No. 1 or No. 2 housing. Housing cast as one unit endures heavy shock loads.



Cotta's PTO

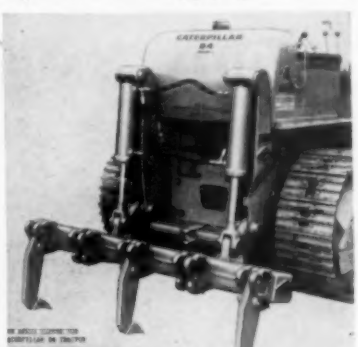
Cotta Transmission Co., Rockford, Ill.

For more details circle 102 on Enclosed Return Postal Card.

Tractor-Mounted Ripper

Designed specifically for Cat D4 Series C tractors, a new tractor-mounted all purpose ripper is now available from American Tractor Equipment Corp.

Heavy duty construction, big fast-acting hydraulic cylinders and wide variety of shanks and replaceable points assures ripping performance with dependability in all types of material. It increases the working range of the Cat D4 tractor for industrial applications. Added features include a high tool beam for ripping the bank as well as the floor. Pitch and depth adjustments for supplying the shank points with the correct digging angle at depths less than maximum. The fold away shank feature which keeps dangerous points retracted, out of the way, yet instantly ready for use without replacing the top pin in the shank holder bracket is included. Tool beam handles up to 5 shanks. Ripping depth is 14 in. for standard shanks, 18 in. optional.

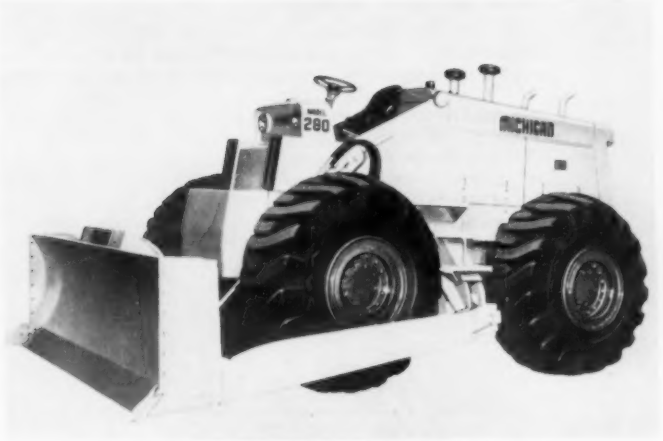


Ateco Rippers

American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland, Calif.

For more details circle 103 on Enclosed Return Postal Card.

*To readers outside of the United States—postal rules forbid use of business reply cards outside of the U.S. Please write to us listing the numbers, month and name of magazine, and mail with your name and address to Inquiry Dept., Roads and Streets, 22 W. Maple St., Chicago 10, Ill., U.S.A.



Clark's 280 Optional Engine

Engine Option for Tractor Dozer

A 290 hp. General Motors diesel engine is now available as optional equipment on the Michigan model 280 Tractor Dozer, according to the Construction Machinery Div. of Clark Equipment Company.

Designed to increase the tractor dozer's flexibility and production, the new engine is a General Motors model 8V-71. It features a two stroke engine cycle, unit injector fuel system, and maximum parts interchangeability. Driven through the Clark power train, the new unit has a top speed of 28 mph. in forward or reverse. The drive line consists of a Clark industrial type 3 to 1 multiplication factor torque converter, four-speed power shift and all-wheel drive. The power shift transmission is the full reversing type with selector for two or four-wheel drive. Axles feature spiral bevel ring gear and pinion with planetary reduction in the wheels. The unit has rear-wheel steering and front axle with locking type differential.

Clark Equipment Co., Pipston Plant, Benton Harbor, Mich.

For more details circle 104 on Enclosed Return Postal Card.

Multi-Purpose Loader-Carrier

A new multi-purpose loader-carrier specially designed for heavy duty material handling has been announced by the Lull Engineering Co.

Called the Lull Dyna-Lugger, the versatile and maneuverable unit boasts power, traction and mobility for loading, lifting and carrying, and has a payload capacity of 15,000 lb. with lift arms retracted—10,000 lb. with lift arms extended. Construction features include rigid frame for strength and stability; power hydraulically boosted 4 wheel steering with independent steering control for the rear wheels; 4 wheel drive with high oscillating planetary type 4 pinion axles and heavy duty transfer case with rear axle disconnect. Operating features of the new machine in-

Lull's Loader-Carrier

clude extendible, variable forward reach of up to 11 ft. 4 in.

Lull Engineering Co., Inc., 3045 Highway 13, St. Paul 11, Minn.

For more details circle 105 on Enclosed Return Postal Card.

Emergency Lighting Unit

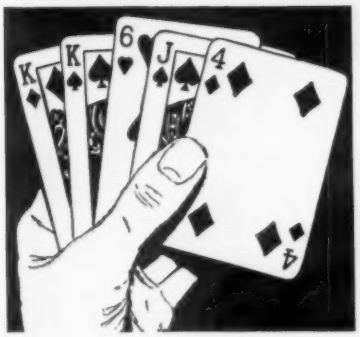
A completely automatic emergency lighting unit is now available from Electric Cord Co.

The Light Warden Chargomatic 88, as it is known, contains no manually operated switches or timers—it plugs into a standard 115 volt, 60 cycle outlet. Normal power maintains battery charge and when power failure occurs, loss of power throws a relay to turn on the emergency lights. The 88 is also available with 3 conductor cord and plug or condulet for permanent AC connection. All units are equipped with test switches. The unit has two flood heads and can support a total of five lights in operation. Battery is a 6 volt, 105 amp.-hour, lead acid, glass jar type and is equipped with visible hydrometer balls, so charge level is instantly known.

Electric Cord Co., 432 Plane St., Newark, N. J.

For more details circle 106 on Enclosed Return Postal Card.

POKER? Play to win!



How would you play this hand?

Odds are 50-50 you're high hand before the draw. Open, or if you're to left of opener, raise. Don't stay on less, though. Queens or under most times are drawing against a better hand.

Here's a sure winner from FORD:

Two new Ford Tractors built for half-yard loading, for 10 ft. or 12 ft. digging!

New 4000 Series Industrial Tractor for work demanding up to 42 drawbar horsepower; new 2000 Series for work requiring up to 32 drawbar horsepower.

Gasoline or diesel, choice of transmissions, job-matched with dozens of front, side and rear attachments.

Get details from your Ford Tractor Dealer, or write:

Tractor and Implement Division
Ford Motor Company
Birmingham, Michigan

Ford
TRACTORS
EQUIPMENT

. . . for more details circle 304 on enclosed return postal card

Motor Grader Stabilizer

4 Wheel Drive Tractor Loader

The introduction of the new TL 30 has expanded the Allis-Chalmers tractor line to six models. This four wheel drive unit becomes the biggest in Allis-Chalmers line of tractor loaders, featuring a 10,500 lb. carrying capacity and a maximum lifting capacity of 25,000 lb.

The new tractor loader is powered by Allis-Chalmers turbocharged "11000" diesel engine with a rating of 184 hp. at 2,200 rpm. Allis-Chalmers points out that single lever shifting lets the operator easily move into a stockpile and instantly drop into a low crowding speed for full-capacity

Allis-Chalmers' Tractor Loader

loading and reverse direction instantly. Six buckets are available from 2½ to 6 cu. yd. Bucket and linkage design gives the unit a breakout force of up to 28,000 lb. and a 42 deg. tip-back at ground level. Also featured is a maximum dumping clearance of 10 ft., 4½ in., and a 37½ in. reach forward from the tires for center loading of high, wide truck bodies.

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

For more details circle 107 on Enclosed Return Postal Card.

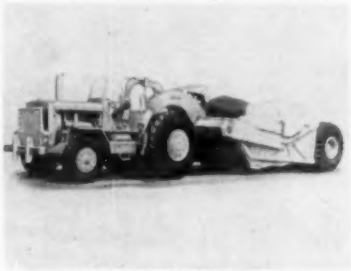
Springtime...
when winter's worst is over!
IT'S TIME FOR ONE-STOP PATCHING - PATCHING THAT STAYS PATCHED!
Best Springtime Maintenance Work is done with
KOTAL
PROCESSED BITUMINOUS STOCKPILE MIX
Tougher, more durable • Adhesive and Cohesive • Longer life
• Consolidates readily under traffic • Instant use in any weather.
For information regarding nearest producer or franchises available, write to:
KOTAL Company
119 SUMMIT AVE.
SUMMIT, N. J.

. . . for more details circle 333 on enclosed return postal card

New 40 Yd. Scraper

A new model scraper, the SS-40 six wheeler, has been introduced by the Euclid Div. of General Motors. Payload capacity is 125,000 lb.; struck capacity is 40 cu. yd. with an SAE rating of 52 yd.

Designed for high production jobs, with long, high speed hauls at speeds up to 34 mph., the SS-40 is powered by a GM 12 cylinder diesel engine of 432 hp. It is equipped with an Allison Tormatic Drive having 4 forward and 2 reverse speed ranges that provide full power shift. Converted lock-up for maximum fuel economy and efficient use of engine power is incorporated in the converter-transmission package. Troqmatic Brake, a hydraulic speed retarder to control



Euclid's 40 Yd. Scraper

speeds on long down-grade hauls, is standard equipment. Engine and transmission oil filters, and the dry type cleaners are conveniently located for fast, easy servicing.

All scraper operations—bowl, apron and ejector—are completely hydraulic with no cable connections. A completely new feature is the double ram actuated "Push-out, Roll-Out" ejector. This combination of forces provides force at the beginning to overcome inertia with maximum speed at the end of the stroke and final snap action for fast, clean shedding of the load. A radial design, power apron is another innovation incorporated into the SS-40.

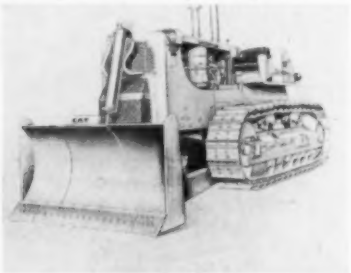
Euclid, Div. of General Motors, Hudson, Ohio.

For more details circle 108 on Enclosed Return Postal Card.

Improved Pushloading Dozers

New, cushion action push dozers, the No. 8C and 9C, that incorporate a single lift cylinder for hydraulic controls have been announced by Caterpillar Tractor Co. for the Cat DS Series H and the D9 Series E tractors.

A case-mounted cushion push block for the D8H and improvements to the 176 hydraulic control for the D8H and the 184 hydraulic control for the D9E were announced concurrently. The versatile cushion push dozers were developed by Caterpillar initially for the D9E to fill a gap between full time bulldozing work and strictly pushloading applications. The No. 8C and 9C bulldozers permit push tractor approach



Cat's Pushloader

and contact with scrapers at relative speeds up to 3 mph. The dozers are equally effective for smoothing the cut, haul road repairs and other normal dozing work, states Cat.

Use of the single lift cylinder give operators improved forward vision. Cable controls also are available for the cushion dozers on both tractors.

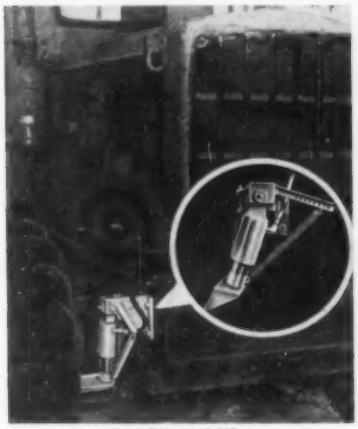
Caterpillar Tractor Co., Peoria, Ill.

For more details circle 109 on Enclosed Return Postal Card.

Motor Grader Stabilizer

A contractor-manufacturer in Aberdeen, S.D., has introduced a motor grader stabilizer which permits safe, accurate grading work.

This new product eliminates jump, galloping and sway in all motor graders with tandem drives, states the maker. An operator in the cab can exercise complete hydraulic control for auto-



Grader-Stabilizer

matic engaging and disengaging of stabilizers. Other important benefits claimed for these stabilizers are the saving of considerable wear and tear on tires and tandem drive mechanisms.

A. W. Schnuerle Mfg. Co., Box 101, Aberdeen, S.D.

For more details circle 110 on Enclosed Return Postal Card.

"Yumbo"—All Hydraulic Hoe-Loader-Shovel With No Outriggers

Hydraulic Hoe-Loader-Shovel

A versatile all-hydraulic hoe-loader-shovel, the Yumbo, is being manufactured by the Hydraulic Equipment Shovel Co.

The Yumbo is made in crawler and self-propelled models with a wide range of working attachments. The basic unit is also factory-mounted on crane-type carriers or is available for mounting on conventional trucks. A high-torque hydraulic motor swing arrangement and 50 ton enclosed double row ball bearing turntable provides continuous rotation in either direction.

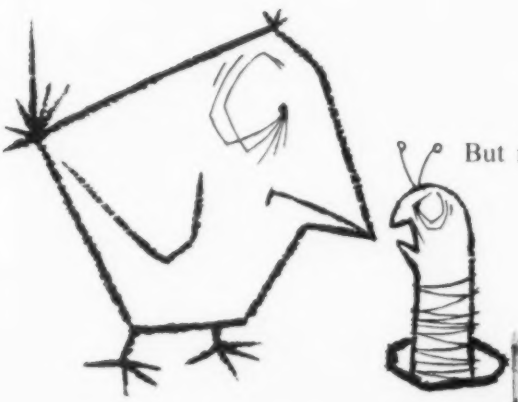
The balance design and geometrical arrangement is reported to eliminate the need for out-riggers on rubber-tired units. Model 35 offers a compact, powerful, rough-terrain crawler with an unusually low ground pressure. Featured is a piston type hydraulic motor driving each track independently, eliminating the entire center pin drive and steering mechanism. The crawler also features sealed lifetime tapered bearing in track rollers.

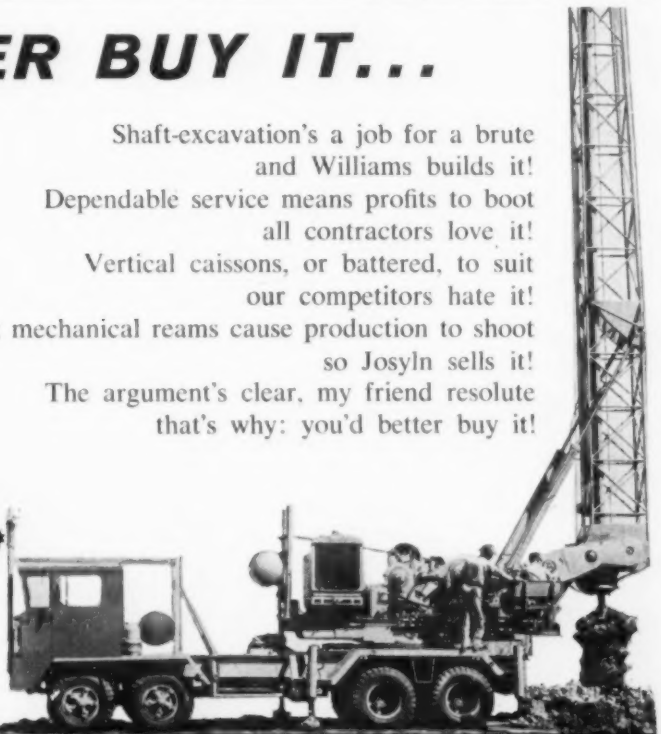
Hydraulic Equipment Shovel Co., Bank of the Southwest Bldg., Houston 2, Texas

For more details circle 111 on Enclosed Return Postal Card.

YOU'D BETTER BUY IT...

Shaft-excavation's a job for a brute
and Williams builds it!
Dependable service means profits to boot
all contractors love it!
Vertical caissons, or battered, to suit
our competitors hate it!
But mechanical reams cause production to shoot
so Josyln sells it!
The argument's clear, my friend resolute
that's why: you'd better buy it!





HUGH WILLIAMS

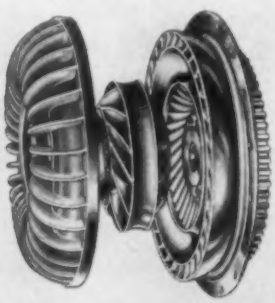
Manufactured by
HUGH B. WILLIAMS MFG. CO.
8330 Lovett Ave.
P. O. Box 7815 • Dallas, Texas

Write Exclusive Distributor
JOSLYN MFG. & SUPPLY CO.
2101 Corinth St. • Dallas, Texas
for DESCRIPTIVE LITERATURE

. . . for more details circle 355 on enclosed return postal card

You'll roll more surface every hour with GALION ROLL-O-MATICS. Proper driving power is applied automatically as needed.

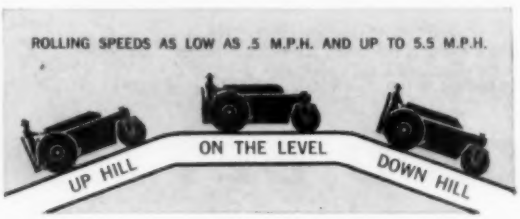
THIS GALION ROLLER won't falter on any terrain. It's equipped with Roll-O-Matic Drive—a highly efficient combination of torque converter, tail-shaft governor and two-speed transmission.



ROLL-O-MATIC DRIVE SELECTS ENGINE POWER . . . AUTOMATICALLY . . . FOR VARYING ROLLING CONDITIONS

ROLL-O-MATIC DRIVE is *standard* on Galion rollers so every user benefits by getting . . .

- AUTOMATIC MULTIPLICATION OF TORQUE. It absorbs the build-up of roller inertia and provides smooth forward-and-reverse action.
- AUTOMATIC APPLICATION OF POWER. It provides an infinite number of drive ratios for speeds in either direction, up grades and down.
- AUTOMATIC REGULATION OF ROLLING SPEED. It allows roller engine to speed up or slow down without stalling or overloading.



For every compaction and finishing job there's a Galion Roll-O-Matic that's just right for you. Sizes? The world's broadest range of variable weights from 3 to 20 tons. Ask for latest catalog data. The Galion Iron Works & Mfg. Company, Galion, Ohio, U.S.A.

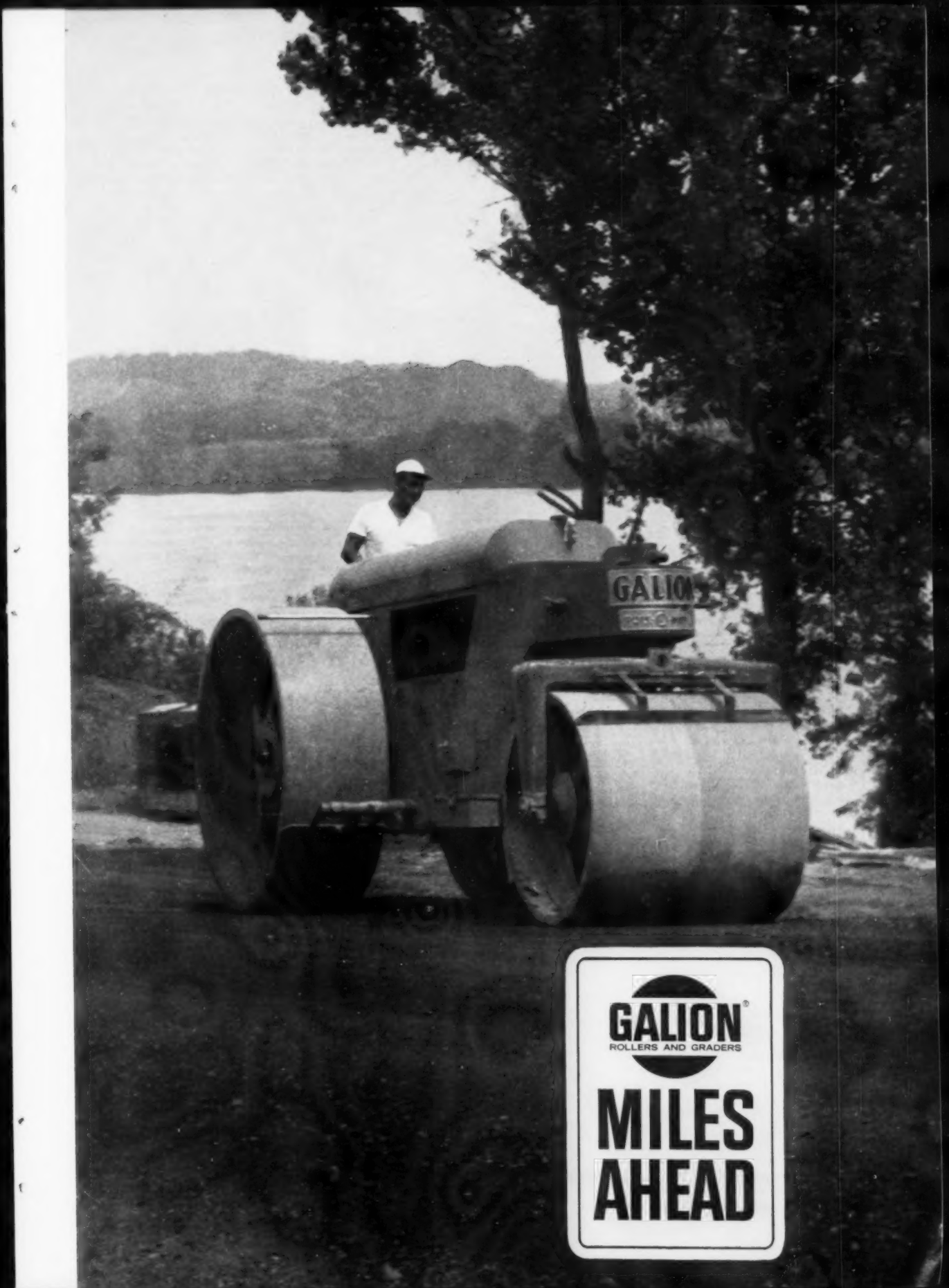
RENT A GALION ROLLER—Keep on schedule—increase profit—without tying up working capital. Ask about the Galion Rent-A-Roller Plan.

THE GALION IRON WORKS & MFG. COMPANY, GALION, OHIO, U.S.A.

GALION® ROLLERS AND GRADERS

General and Export Offices, Galion, Ohio, U.S.A.—Cable Address, GALIONIRON, Galion, Ohio

. . . for more details circle 309 on enclosed return postal card



pump circulates and filters lubricant

IH's new experimental UET—A mechanical handy-man to heavy equipment.

Test Model Crawler Tractor

A crawler tractor that is reported capable of being a scraper, dump truck, grader, cargo carrier and a high speed prime mover is currently under test by International Harvester's construction equipment engineers, according to an announcement by the Construction Equip. Div. of that company.

Called the Universal Engineer Tractor, it has been designed and built by the Government Engineering Section under a research and development contract to the U.S. Army. While many of its functions are essentially land operated, the experimental tractor crawler tracks will propel it across rivers and lakes at a speed of four mph. It is also built for deep fording and for working and towing in water to a depth of more than 6 ft. The first models are more than 35 percent aluminum to minimize weight. The unit can double its weight by using earth or other ballast to provide a maximum drawbar pull.

A hydro-pnuematic suspension system permits the operator to turn his springs on and off with a control handle on the instrument panel. Sprung, the crawler can move smoothly at 30 mph.: unsprung it can move earth, or work with a crane boom.

The earth capacity of the rig, when being used as a scraper, is 7.4 cu. yd. struck, or 8.5 cu. yd. heaped. A hydraulic gate in the bowl serves as an ejector, making possible for the UET, as a scraper, to spread its load on the go or dump at the base of a wall or over an embankment.

The operator sits in the rear, over the 250 hp. V-8 engine where he can observe the bowl during scrape-loading and see down the full 220 in. of the machine.

A future machine, now being designed, will be diesel powered and combine steering, braking and all motion in one lever.

International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

For more details circle 112 on Enclosed Return Postal Card.

Bench Model Cement Tester

Compression and flexure testing of cement blocks, beams and other samples, with speed and precision is now provided by the new Tinius Olsen 24,000 lb. capacity Super L testing machine.

By flipping a switch, the operator can instantly obtain any one of three load ranges—24,000 lb; 12,000 lb., or 600 lb. Range can be changed at any time during test. In addition, by means of an optional pacing unit, uniform loading rates can be maintained. Testing speeds of from 0 to 3 in. per min. can be precisely controlled by a micrometer needle load valve. To provide maximum flexibility for testing of a wide range of small specimen sizes and shapes, the new bench model unit is designed with an 8 in. clearance between screws, a compression opening of 11 in. and 3 in. hydraulic stroke.

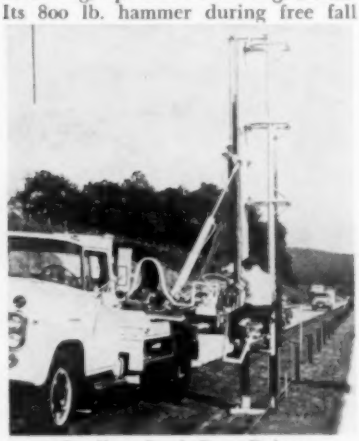
Tinius Olsen Testing Machine Co., Easton Rd., Willow Grove, Pa.

For more details circle 113 on Enclosed Return Postal Card.

Post Driver

The 1961 model Sterling steel post driver has been introduced by the Sterling Engineering & Mfg. Co.

The driver is hydraulically controlled and, with turntable fore and aft mounting, operates in 180 deg. radius. Its 800 lb. hammer during free fall



Sterling Steel Post Driver

develops a 10,000 lb. impact. Rugged, tubular drive frame holds post in positive alignment. The machines are distributed by Wyoming Valley Equipment Div.

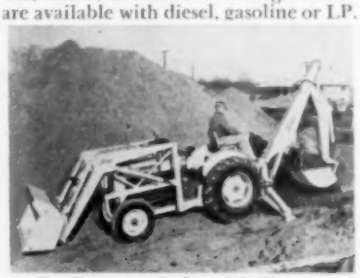
Wyoming Valley Equip. Div., Wyoming Ave., Kingston, Pa.

For more details circle 114 on Enclosed Return Postal Card.

Industrial Tractor

Two new series of industrial tractors —the 2000 and 4000 and a new front mounted loader were announced in volume production at Ford.

The new tractors in both series have new features in common: a cast steel one-piece front axle rated at 5000 lb. capacity, power steering, foot throttle. They also use Ford's Red Tiger 4 cylinder, inline, overhead-valve engines and are available with diesel, gasoline or LP.



Ford's 4000 Industrial Tractor

gas fuel options. The 4000 uses a 172 cu. in. displacement engine for all three fuels, while the 2000 boasts 134 cu. in. displacement for the gasoline and LP gas models and 144 cu. in. for the diesel. Four transmission options, including ten-speed "Select-O-Speed" power shift transmission and three types of constant mesh transmissions are available.

Ford Motor Co., Tractor & Implement Div., Birmingham, Mich.

For more details circle 115 on Enclosed Return Postal Card.

IH's TD-20 Crawler—6 Cylinder Diesel & 6 Speed Transmission

6 Cylinder Diesel Crawler

Production of the new International TD-20 crawler—second largest of the International line of crawlers has been announced by the Construction Equipment Div. of International Harvester Co.

Equipped with a 6 cylinder, International TD-691 turbocharged diesel engine, the unit develops 140 engine hp. at 1,550 rpm. Boasting 6 speed, full-reverse transmission, it has a drawbar hp. of 113. A 50 percent increase in torque rise to handle larger overloads is accomplished through use of all-altitude, modern turbocharging.

The TD-20 is equipped with a new dry-type air cleaner, which increases efficiency in filtering air volume carried into the engine by the turbocharger.

The gasoline conversion system, with its push-button feature, assures fast, all-weather starting for the TD-20's diesel engine. A larger radiator top tank, eliminating the need for an auxiliary tank, has been added to the new TD-20. Working life of vital components of the rig's transmission has been lengthened materially, while transmission increased hp., through use of anti-friction roller bearings of increased capacity, heavier shafts, and gears with added strength and greater tooth area. A new transmission oil pump circulates and filters lubricant for longer gear life.

International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

For more details circle 116 on Enclosed Return Postal Card.

Safety Flash Vest

A new safety flash vest, made of vinyl coated heavy cotton base and in a vivid fluorescent orange-red with contrasting wide luminescent White stripes is being manufactured by Warren-Knight Co.

Designed to fit over any type of clothing, it is perforated for coolness. Secured by heavy cloth tapes through

Warren-Knight's Safety Vest

elastic cloth loops, complete freedom of movement is assured. Visible contrast is obtained on sunless days.

Warren-Knight Co., 136 N. 12th St., Philadelphia 7, Pa.

For more details circle 117 on Enclosed Return Postal Card.

Concrete mix would grind the markings off most tapes!

This is Lufkin's Mezurall® tape . . . with unmatched Chrome Clad® blade that fights concrete, sand, mud and other abrasives.

Lufkin starts with a special tempered steel . . . bonds the markings to it. Then layer after layer of electroplating is applied, topped by a final layer of tough chrome. There's no other blade like it. Comes in 6′, 8′, 10′ and 12′ lengths . . . either ½″ or ¾″ widths. The Lufkin Rule Company, Saginaw, Mich.

Measure for measure, the finest made...

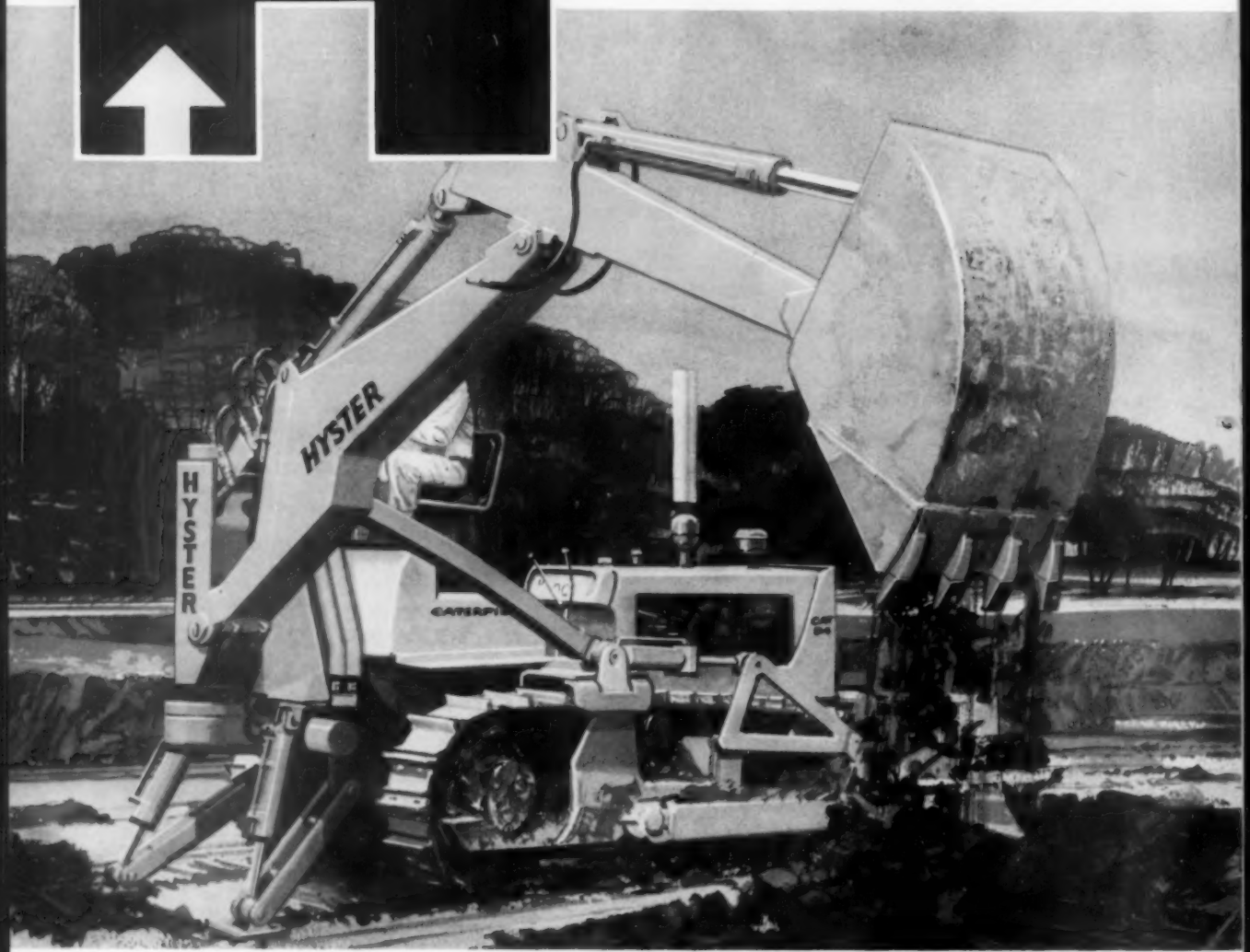
LUFKIN

SAGINAW, MICHIGAN

. . . for more details circle 338 on enclosed return postal card

HYSTER

NEW



Handles up to 13.5 Cu. Ft. at a bite
...more than 4 payloads a minute

The new Hyster Backhoe is a high production rig. Handles a 30-inch dipper as easily as competitive machines handle 16-inch dippers... digs up to 93 cu. yds. per hour. This rugged hoe, built to take it, will help you make a profit, even on your toughest jobs.

Designed for these Caterpillar built machines:

D4 TRACTOR
No. 955 and 955H TRAXCAVATORS
HT4 TRAXCAVATOR

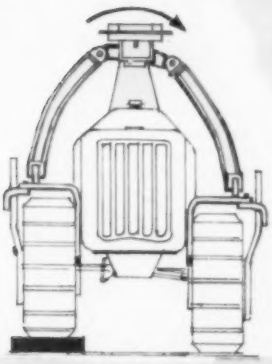
Caterpillar and Cat are registered trademarks of Caterpillar Tractor Co.

Compare these Production Figures

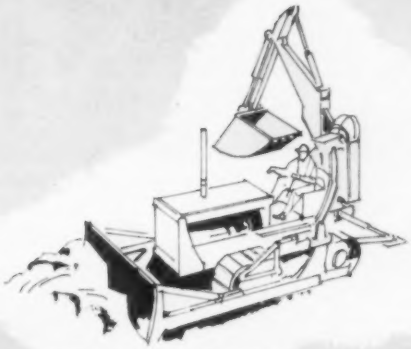
HYSTER HYDRAULIC BACKHOE
OUTDIGS THEM ALL!

7,800 lbs. of Working force*

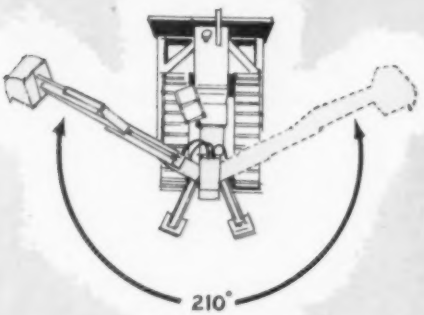
THE HOE THAT'S BUILT TO MAKE YOU MONEY!



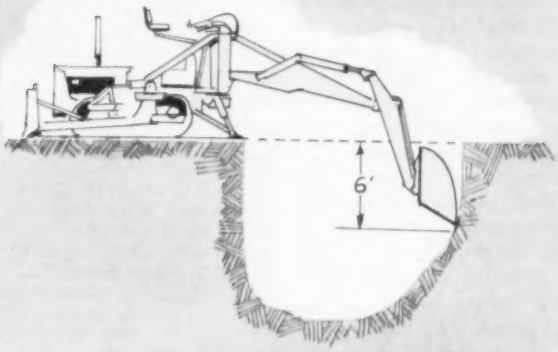
FULL TRACK OSCILLATION is provided by exclusive pivoting equalizer beam which compensates for back-stay strut movement as tracks oscillate.



ONE MACHINE DOES THE WORK OF TWO—Use the tractor with backhoe mounted for heavy-duty bulldozing, leveling up, clearing and back-filling.



210-DEGREE SWING—WIDEST IN THE INDUSTRY. Digs full 12'6" depth through 200 degrees. Wide angle offers greater choice in locating spoil pile or trucks.



DIGS STRAIGHT BACKWALLS TO 6 FEET DEEP—A result of 143-degree dipper curl. Full digging depth 12'6". Maximum reach from center of swing is 17'4½".

TWO PUMPS—provide full-power *simultaneous* swing *and* boom or stick operation.

Actual on-the-job production:

30" DIPPER

Pit excavation 93 cu. yds. per hr.

Trenching .... 62.6 cu. yds. per hr.

22" DIPPER

Pit excavation 71.4 cu. yds. per hr.

Trenching .... 47.4 cu. yds. per hr.

*Working Force—Key to High Production

The *only* hydraulic hoe that has the required tractor weight to convert 7,800 pounds of breakout force into 7,800 pounds of *working* force. That's why *no other* tractor mounted hydraulic hoe can match the production... and the profits you get with the new Hyster Backhoe.

Call your Caterpillar-Hyster Dealer for details and demonstration

HYSTER COMPANY TRACTOR EQUIPMENT DIVISION
P. O. Box 328 • Peoria, Illinois

TRACTOR EQUIPMENT DIVISION - Construction and logging equipment
INDUSTRIAL TRUCK DIVISION - Lift trucks, mobile cranes, straddle carriers
MARTIN TRAILER DIVISION - Heavy machinery hauling trailers
INTERNATIONAL DIVISION - Overseas manufacturing, sales and service

Manufactured in: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill.
Australia • Brazil • England • France • The Netherlands • Scotland • Union of South Africa

. . . for more details circle 319 on enclosed return postal card

P&H's 890 TC—90 Tons and 200 Ft. Main Boom

90 Ton Truck Crane

A truck crane capable of lifting 90 tons and building up to 200 ft. of main boom and 50 ft. of jib has been announced by Harnischfeger Corp. The giant machine is the P&H model 890-TC.

The firm's power crane and shovel division described it as a highly mobile machine for heavy rigging, tall structure erection, heavy-duty pile driving, high-level and long range concrete placing and for handling large capacity buckets when used as a clamshell or dragline. The 4 axle, 12 wheel carrier designed and built by Harnischfeger utilizes planetary axles and a 280 hp. diesel engine to provide on and off the road mobility comparable to smaller and lighter rigs. Clearance for traveling are 13½ ft. vertical and 11 ft. horizontal, without any dismantling required to achieve these clearances. Basic 50 ft. boom can be carried over the front with these clearances.

Harnischfeger Corp., 4445 W. National Ave., Milwaukee 46, Wis.

For more details circle 118 on Enclosed Return Postal Card.

Four-Man Truck Cabs

Announcement of a new cab that provides comfortable seating with full leg room for four men has been made by the White Motor Co.

Designed and engineered for utility industries, the new cab is all steel construction and is for use on the company's 3000 Series chassis. Steering column and vehicle controls are all located at the extreme left of the cab to provide handling for the driver. The driver's seat is fully adjustable with movement allowed in three directions. The additional three man seat is fixed with a flat floor providing ade-

White's 4 Man Truck Cab

quate leg room for comfortable seating. A large shelf to the rear of the seats allow room for radio and any other special equipment that might be required in regular or emergency work.

White Motor Co., 842 E. 79th St., Cleveland, Ohio

For more details circle 119 on Enclosed Return Postal Card.

Tamping Roller

A new tamping roller for high-speed Compaction has been introduced by American Steel Works.

Called the Road Runner Wedgefoot, model FDB120 yoke tongue roller is claimed suitable for such tractors as the John Deere 840 and the Cat DW10. Empty weight is 12,650 lb. This design features replaceable cleaner tooth tips, both front and rear. Roller drums are 4 ft. in dia. and 5 ft. in length. Oscillating bolts are not in tension in this model.

American Steel's Tamping Roller

American Steel Works, 1211 W. 27th St., Kansas City, Mo.

For more details circle 120 on Enclosed Return Postal Card.

Utility Bulldozer

A new product recently announced by Ulrich Mfg. Co., the Ulrich Model 6H Varidozer, is a completely different utility bulldozer with an almost unlimited range of hydraulically-controlled blade positions.

The Varidozer can be changed in seconds from a straight blade to an angle blade, forward V, reverse V, tilt blade, or to any combination of these positions. The entire cycle of positions is controlled by 4 hydraulic levers mounted beside the tractor seat, giving instantaneous finger tip control of the blade, under full load or empty,

Ulrich's Varidozer

while the machine is moving in either direction. The machine's versatility is attributed to the sturdy vertical hinge in the center of the blade, controlled by two rugged hydraulic push arms and two hydraulic tilt cylinders. Built to withstand terrific impact, the hinge permits each of the two sections of the blade to move independently to any position from 25 deg. angle forward to a 25 deg. to the rear. With the hydraulic control levers, the tractor operator can quickly select any position in between for either side of the blade, even under load. It has been designed for Cat D6 tractors.

Ulrich Mfg. Co., Roanoke, Ill.

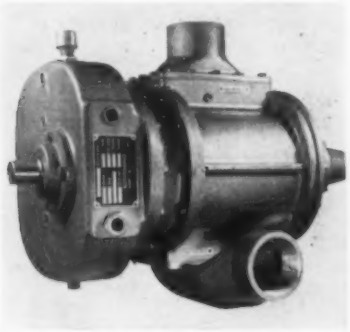
For more details circle 121 on Enclosed Return Postal Card.

Bulk Unloading

Developed for heavy-duty bulk unloading, two new portable "Cyclo-Blowers", manufactured by Cyclo Blower Co., are said to provide air at pressures up to 16 psig in continuous operation or up to 20 psig in intermittent operation.

Model A5CDL9 is driven by power take-off, model A5CDL12 by separate gasoline engine. Either gives high enough pressure to allow the pneumatic unloading of cement and similarly dense granular materials. Horse-

power requirements are not substantially increased because of CycloBlower's twin screw type rotors. Air is taken in and discharged from the helical pockets formed between the



CycloBlower's Compressor

precision-machined rotors. Model A5CDL9, driven by the tractor PTO shaft at 1,200 to 1,800 rpm, has an air-moving capacity of 300 to 500 cfm. The trailer mounted unit is driven by a 50 hp. gasoline engine at 2,400 to 2,800 rpm. It operates within the same cfm range at the power take off model.

CycloBlower Co., York, Pa.

For more details circle 122 on Enclosed Return Postal Card.

Automatic Road Builder

A new model of the Gurries Automatic Road Builder has been announced by Gurries Mfg. Co.

The automatic road building machine, the GARB-44, is a versatile, high production, precision road construction machine which can be used for almost every grading and spreading operation in highway construction. A feature of the new GARB and the prime reason for its value in road work, is its ability to automatically maintain blade height and cross slope in relation to selected reference. Through an automatic hydraulic system, the height of the blade can be controlled by wire follow, left or right wheel follow or planning. While operating in any of these manners of blade height control, the cross slope is automatically held to the desired setting by the pendulum control. Cross slope can be set for anywhere from 0 to 25 percent fall, left or right. The accuracy of the device, combined blade height and cross slope controls accurate to 1/25th in. in 13 ft. and its uniform non-segregating spreading action, make it of particular interest to contractors. A 20 in. power screw casts excess material while grading or balances bowl load for uniform strike off while spreading. The rig is used for grading and/or spreading subgrade, rock base, cement treaded base and shoulders.

Gurries Mfg. Co., San Jose, Calif.

For more details circle 123 on Enclosed Return Postal Card.

Heavy-Duty Riding Mower

A new, extra-heavy-duty riding mower, called the "Super 60" is being introduced to the market by Pennington Mfg. Co.

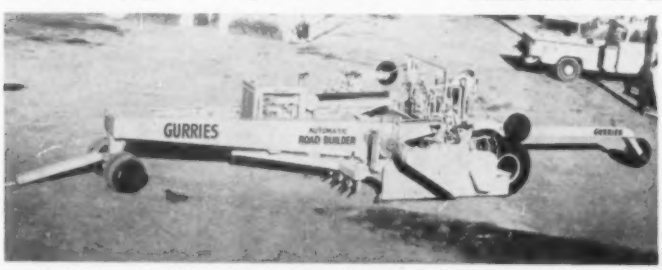
According to the manufacturer, the new machine is specifically designed for the tough mowing jobs. The same source states that the mower's powerful 12.9 hp. two-cylinder Onan engine gives power to spare for tollway and expressway mowing. Extra large wheels give the mower more clearance, and make it possible to raise mowing deck to 7 in. The large wide tread wheels

Pennington's "Super 60"

also provide excellent flotation in marshy or sandy soil, and assure a sure-footed performance on steep grades. The device is said to have a comfortable seat, easy-to-reach levers and three high-speed 20 in. blades. Clippings are ejected with a minimum of windrowing; mowing deck design and runners under side blades prevent scalping under most conditions, reports the manufacturers.

Pennington Mfg. Company, Addison, Ill.

For more details circle 124 on Enclosed Return Postal Card.



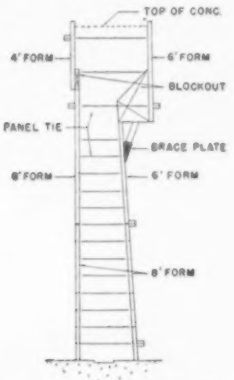
Gurries Road Builder

Battered Walls

Symons Forms on St. Louis Expressway

. . . Form Double Battered Walls 12" at Top, 3' at Base

On the downtown phase of the St. Louis Mark Twain Expressway, contractor R. B. Potashnick & J. S. Alberici Construction Company used 8,000 sq. ft. of Wood-Ply and 20,000 sq. ft. of Symons Steel-Ply Forms.



Job called for retaining walls, many of them double battered so that forms were angled to give 12" top thickness and up to 3' thickness at base. Heights varied from 4' to 34'. In addition, the forms were used to pour footings, abutments, piers and beams. Contractor obtained 30 re-uses.

Symons Forms may be rented with purchase option. Additional information on how to use Symons Forms for *battered walls* sent on request.

Symons

SYMONS CLAMP & MFG. CO.
4283 Diversey Ave., Dept. D-1, Chicago 39, Ill.

MORE ***SAVINGS*** *FROM* ***SYMONS***

. . . for more details circle 349 on enclosed return postal card

CHEVROLET

SEEN IN ALL THE WORST PLACES

They keep showing up in places most trucks can't get to because it takes an awful lot to stop these sure-footed Chevy four-wheel-drive models! Where the job calls for the mobility of a mountain goat teamed with the stamina of a mule, you'll find no finer way to get your work done. And for 1961 the Chevrolet 4-wheel drive lineup is a full dozen models long. You can pick from a *wide* selection — one that's sure to include the best answer to your toughest traction-plus requirement!

■ Put any one of these 4-wheel drive Chevies on any job—then watch it dig in and *go!* Come what may in the way of mud, snow, sand, loose gravel, creek bottoms, swampland or freshly plowed ground, you can rest assured that the extra bite of up to double traction—plus stump-jumping road clearance—will get you through every time.

And you'll like the way a Chevy 4x4 rolls down the highway in smooth 2-wheel drive, ready to give you 4-wheel traction at the flick of a lever, the moment you need it. You'll appreciate the no-clutch shifting ease of the transfer case (whether moving or standing still) and the extra versatility that's yours with a choice of 4-wheel direct or underdrive.

If you prefer the extra snap of spirited V8 power, it's yours at nominal extra cost in any model. Also available at extra cost are heavy-duty 3-speed and 4-speed transmissions and a wide choice of traction tires. You can tailor your Chevy 4 x 4 to fit your needs exactly. Get the full details and turn your traction problems over to Chevy—the traction champ of them all!... Chevrolet Division of General Motors, Detroit 2, Michigan.

FLEETSIDE

Model	Max. Load	Body Length
K1434	1400 lb.	6½′
K1534	1300 lb.	8′
K2534	2950 lb.	8′

STEPSIDE

Model	Max. Load	Body Length
K1404	1450 lb.	6½′
K1504	1350 lb.	8′
K2504	3050 lb.	8′

CHASSIS-CAB

Model	Max. Load	Wheel-base
K1403	1900 lb.	115″
K1503	1850 lb.	127″
K2503	3500 lb.	127″

PANEL CARRYALL

Model	Max. Load	Body Type
K1405	1300 lb.	7½′ Panel
K1406	1000 lb.	Carryall (panel type rear doors)
K1416	1000 lb.	Carryall (tailgate and liftgate)

SEND COUPON TODAY

PLEASE SEND COMPLETE INFORMATION ON THE CHEVROLET 4-WHEEL DRIVE LINEUP TO:

Name_____

Company_____ No. of trucks owned_____

Address_____

City_____ Zone_____ State_____

Fill out and mail coupon to:
Commercial and Truck Dept.
Chevrolet Motor Division
General Motors Corporation
Detroit 2, Michigan

25

1961 CHEVROLET STURDI-BILT TRUCKS

CHEVROLET

. . . for more details circle 312 on enclosed return postal card

SAFE ALL AROUND!

180° SPEED SWING

ALL-PURPOSE MATERIAL HANDLER

No other equipment in the material handling field offers as much *all-around safety* as the Pettibone 180° Speed Swing!

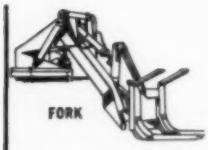
The exclusive Pettibone 180° boom swing permits the operator to load either alongside or in back of trucks. The long boom is located forward, keeping the bucket far out in front of the operator to provide fullest protection from spilled loads. There are no side arms to endanger the operator, as with other loaders. Also, being closer to the ground and with no obstructions around the seat, he can get on and off the machine easily . . . from either side!

Because of its 180° swinging boom, the Speed Swing is not forced to maneuver back, forth, and all around constantly when loading. It SWINGS THE LOAD instead! This means far *fewer* machine movements and *faster* work cycles . . . with *greater safety* to other workmen, other equipment, and to moving traffic on streets or highways.

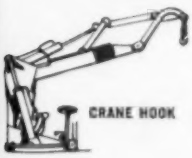
The long boom reach prevents bumping trucks when loading from side or rear. Other type equipment cannot provide this high safety factor. Also, the longer wheelbase, wider tread, and low center of gravity mean more stability and greater safety in moving heavy loads.

And there's *full* operator visibility for any one of the 10 *quickly-interchangeable* attachments shown at right, at all times during use. To top it off, you make the *safest investment of all* when you choose the Pettibone 180° Speed Swing . . . the most outstanding all-purpose material handler for ALL YOUR JOBS!

Find out all about it today. Get all the facts on how to safeguard your profits, your working crews, your investment in equipment—and be SAFE ALL AROUND! Write to—


FORK

BUCKET

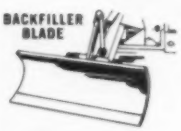

CRANE HOOK

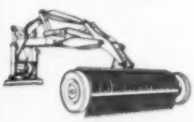
18' BOOM EXTENSION

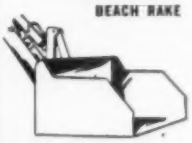
WIRE & PIPE HOOK

BACKHOE

CLAMSHELL


BACKFILLER BLADE


BEACH RAKE


4 CU. YD. SNOW BUCKET

PETTIBONE MULLIKEN CORPORATION

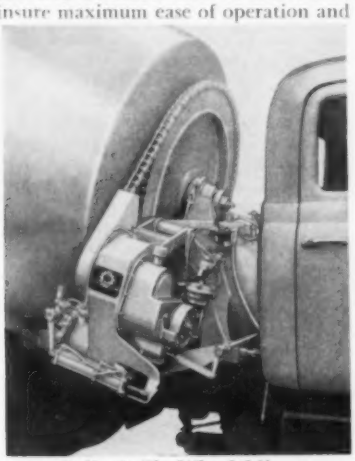
4700 WEST DIVISION STREET • CHICAGO 51, ILLINOIS

. . . for more details circle 344 on enclosed return postal card

Fly Wheel Drive Mixer

The Transmatic concrete mixer, said to operate smoothly on any truck with flywheel drive transmission, is now offered to the industry by the Transit Mixer Div. of Hercules Galion Products, Inc. The versatile mixer can be driven equally well by flywheel drive power take-off, separate engine or front-of-truck engine.

Pushbutton controls, located in truck cab and at either end of the mixer, insure maximum ease of operation and



Galion's Fly Wheel Mixer

help reduce operating effort. To insure maximum power for operating over rough terrain, the Transmatic offers cab controlled pushbutton activated drum drive cutout. This feature insures full engine torque for maximum traction when needed. As an added safety check an auxiliary manual control is provided for mixing and discharging of concrete. The electric-air control system can be easily serviced by the average mechanic, without benefit of special training.

Transit Mixer Div., Hercules Galion Products, Galion, Ohio

For more details circle 125 on Enclosed Return Postal Card.

Portable Winches

The manufacture and sale of a new line of portable winches was announced by the Superior Mfg. Co.

Sold under the trade name 'Porta Winch', the equipment is engineered to supply winch power in hard to reach locations where heavier equipment cannot be used. The PortaWinch

Superior's Porta Winch

is suited for use in equipment yards and large industrial applications. The machine fits easily into a pick up truck and is light enough to be handled by one man. Special features include sled type base, safety stop to prevent loss of load, welded anchor chain, self-adjusting clutch and steel cable roller.

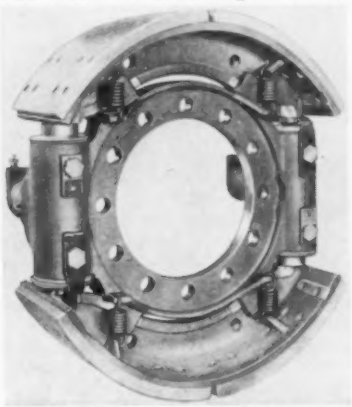
Superior Concrete Machinery Co., 5352 W. Broad St., Columbus 4, Ohio

For more details circle 126 on Enclosed Return Postal Card.

Heavy-Duty Brake

To meet the growing need for more versatile and compact braking equipment for off-highway operations, Rockwell-Standard has introduced a new brake design with their recently developed heavy-duty Stopmaster Brake.

Operating on a totally different "balanced design" actuation principle, the brake provides equal braking effort by both brake shoes for performance, operation and uniform lining wear. Hy-



Rockwell-Standard's Brake

draulically actuated, the Stopmaster is available in 17 to 26 in. dia. and in 4 to 10 in. widths for a wide variety of earth-moving construction and special applications. Periodic lubrication is eliminated, since all actuation parts are located internally and sealed in lubricant. Automatic adjustment, an optional feature, eliminates periodic manual adjustments, and reduces maintenance costs, with safer operation.

Rockwell-Standard Corp., Brake Div., Ashtabula, Ohio

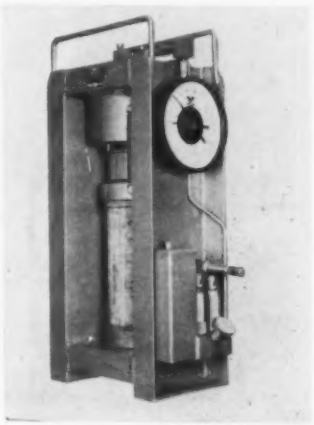
For more details circle 127 on Enclosed Return Postal Card.

Concrete Tester

A new addition to the line of Forney concrete testing machines has been announced by Forney's, Inc.

The model FT-10 Jobsiter is a portable type machine for testing cylinders, blocks, bricks, cubes and beams of rugged, all welded construction and 250,000 lb. load rating.

The 8 in. dia. gage is located in one of the vertical channels and cushioned with sponge rubber. The dial has an opening which exposes critical adjusting points so that recalibration is very much simplified. Weighing 365 lb. the device can be easily carried in the trunk of a passenger car, and for per-



Forney's Concrete Tester

manent locationing, provision has been made for bolting.

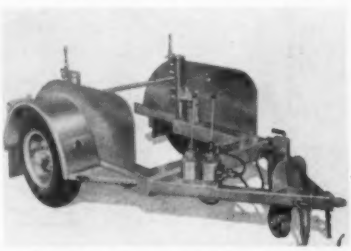
Forney's Inc., Tester Div., P.O. Box 310, New Castle, Pa.

For more details circle 128 on Enclosed Return Postal Card.

Hydraulic Cable Reel

A new series RM Reel-Master hydraulic cable reel trailer which can be operated by one man, was recently added to the line of Powers-American utility bodies, diggers and derricks manufactured by McCabe-Powers Body Co.

It was reported that one man can easily load and attach the machine to the towing vehicle without the help of a crane or winch. Two hand-operated



McCabe-Powers Hydraulic Reel

pumps with independent hydraulic cylinders permit effortless elevation and level to payout or travel position. A diverter valve permits operation of the landing wheel cylinder with the same pumps. When it is necessary to park this trailer on uneven ground, the independently operated hydraulic cylinders raise or lower either side of the reel to facilitate removal or cable payout. Trailers are available in 3 sizes, RM-8, RM-10 and RM-12 for carrying reels up to 54 in. wide and 96 in. in dia.

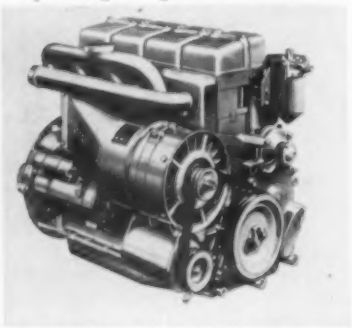
McCabe-Powers Body Co., 5900 N. Broadway, St. Louis 15, Mo.

For more details circle 129 on Enclosed Return Postal Card.

Air-Cooled Diesel

An additional air-cooled diesel engine has been added to the SL series of Lister-Blackstone equipment.

This is a Model SL 4 developing 20 hp. continous at a maximum of 2150 rpm. Reported to be an extremely neat, compact, lightweight, air-cooled diesel



Lister Model SL 4

engine, it has an over-all length of only 29½ in. and 28 in. high. All working parts are interchangeable with the SL ⅓ units. Twelve volt electric starting is included as standard equipment and contrary to the 1 to 3 cylinder version, cooling is effected by an axial flow fan belt driven from the crankshaft.

Lister-Blackstone, Inc., 42 21st St., Long Island City 1, N.Y.

For more details circle 130 on Enclosed Return Postal Card.

Aluminum Steel Concrete Mixer

The availability of a new truck mixer that offers many states a 7½ yd. legal payload has been announced by the T. L. Smith Co.

Smith is now offering an aluminum-and-steel truck mixer that boosts legal payloads as much as 2,300 lb. per trip. According the company engineers, this

Smith's Lightweight Mixer

extra legal payload has been accomplished with no sacrifice in structural or resistance to abrasion and impact. Lightweight aluminum alloys are used in the frame, torsion bar, platform, spout and chutes. High-strength, abrasive-resistant steel are used for drum, gears, transmission, rollers and other parts subjected to extreme service. The company further reports that this unit has been custom-designed for maximum legal operation in those states with 32,000 lb. rear axle, 50,000 lb. gross weight laws.

T. L. Smith Co., 2835 N. 32nd St., Milwaukee, Wis.

For more details circle 131 on Enclosed Return Postal Card.

New Landscape Seeder

A new landscape seeder with the flexibility to provide exact, accurate work on a wide variety of seeding jobs has been developed by John Deere engineers.

The new seeder—the John Deere 265—can be used for planting any lawn or cover-grass mixtures, including legume seeds. It has a wide range of seeding settings. It can plant at the light

Deere's Landscape Seeder

seeding rate of ½ lb. to an acre for seeds such as red fescue; while ranges extend as high at 360 lb. per acre setting for seeding grasses such as bermuda or some clovers. It has a similar wide range of performance for spreading fertilizer, being able to spread granular fertilizers at a range anywhere between 100 to 800 lb. per acre. The new seeder is a three-point-hitch unit which can be attached or removed from any three-point-hitch tractor in minutes.

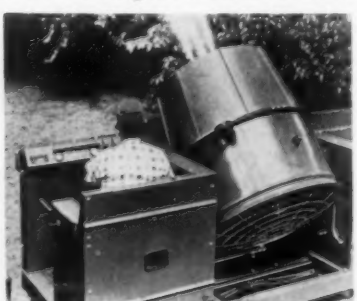
Deere & Co., 3300 River Rd., Moline, Ill.

For more details circle 132 on Enclosed Return Postal Card.

New Air-Type Sprayers

Two new models have been added to the line of Rotomist Shade Tree Sprayers manufactured by John Bean Div., Food Machinery & Chemical Corp.

The new units, Models 91 and 301, have been designed to fill the needs of



Rotomist Tree Spray

municipalities for large as well as medium capacity shade tree sprayers. The new Model 301 is said to replace as many as six men using spray guns from a high pressure spray rig. Because of its high air volume delivery, wind is not as much a factor as in smaller sprayers. Model 301, delivering spray solution at 20 gpm, is available as a trailer model with tandem axles or as a skid model. Model 91, with a capacity of 10 gpm, is also available as either skid or trailer mounted model.

John Bean Div., Food Machinery & Chemical Corp., Lansing, Mich.

For more details circle 133 on Enclosed Return Postal Card.

Crawler-Mounted Ditch Straddler

A new conversion unit that permits crawler-mounted Insley type K and L draglines and backhoes to straddle wide ditches has been announced by Insley Mfg. Co.

Named the "Ditch Straddler", the conversion unit provides extra width between crawler tracks. The unit can

Insley's "Ditch Straddler"

be furnished to lengthen track in various widths up to 15 ft., center to center. The conversion unit may be supplied as original equipment or for field change-over. The adapter unit is self-contained and can be quickly assembled or disassembled. It consists of a structural member which extends the carbody axles and cross propel drive shaft mechanism, widening the over-all width of the track treads.

Insley Mfg. Co., P.O. Box 167, Indianapolis, Ind.

For more details circle 134 on Enclosed Return Postal Card.

Open Gear Lubrication

The addition of Spray Open Loob to the line of Spray products has been announced by the Spray Products Corp.

The new Loob in the 16 oz. pressurized can was developed to protect open and exposed gears without the use of messy pails, brushes or grease guns. It will lubricate hard to reach areas.

Spray Products Corp., P. O. Box 1988, Camden 1, N. J.

For more details circle 135 on Enclosed Return Postal Card.

How many "machines" is a MODERN LOADER?

JOB-PROVE the 4-in-1 and see . . .

Here's what the 5 Four-in-One's, shown, are doing: (1) (Left foreground) The 3-cu. yd. TD-20 rig is 'dozing; (2) (Right foreground) The ¾-cu. yd. T-340 outfit as "carry-type scraper;" (3) (Right center) The 1⅛-yd. TD-6 4-in-1 "semi-skids" load on its skid shoes; (4) (Center): This 2¼-cu. yd. TD-15 "biting bucket" clam-handles a stump; (5) (Rear) TD-9 rig is back-dragging gravel!

It's a whole equipment spread of job-getting actions, if it's "the bucket with the bite"—an exclusive clam-action International Drott 4-in-1.

"Dragonized" to dramatize "the bucket with the bite," the five 4-in-1 sizes above demonstrate *plus* actions you get with the exclusive clamshell.

Full-capacity, full-range, depth-controlled bull-dozer performance. "Carry-type scraper" action to grade, strip, or spread with inch-close accuracy. Skid-Shovel action to "semi-skid" full buckets of material. Controlled back-dragging clam-action, to grade, pick up, or pull down materials. "Clamming-on" action to grab and load heavy unwieldy "impossibles."

Note also the 4-in-1 gives you the top excavator-loader performance on the market! That includes certified break-out forces ranging from 11,200 lbs. with the T-340, to 43,150 lbs. with the TD-20. And only the 4-in-1 gives you clam-type bottom dumping—that ends sticky materials loading problems, for good!

See for yourself how many "machines" the only *modern* loader is! Move the 4-in-1 machine-action selector lever. Prove you get a whole spread of money-making actions, that obsolete "single-action" loaders, and double for a yard-full of limited-duty rigs! See your International Drott Distributor for a 4-in-1 demonstration.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

. . . for more details circle 323 on enclosed return postal card

THE CONTRACTORS, ROCKY MOUNTAIN PAVING COMPANY of Colorado Springs, laid this section with Texaco Asphaltic Concrete in "record time." Thus they prevented traffic delays, minimized inconvenience to motorists.

Texaco Asphalt helps solve difficult drainage problem

This high, winding and scenic road stretches between Cedar Edge and Grand Mesa, Colorado. It's part of State Highway 65, a farm-to-market road that sweeps around the western slopes of the Rockies.

To build a durable all-weather road, the Rocky Mountain Paving Company first had to lick an important problem: poor drainage of the clayey subbase. To do this, they laid a substantial 4" base of crushed rock along the entire 10-mile stretch. Then they laid a 2½" pavement of hot-mix Texaco Asphaltic Concrete, using 120-150 penetration asphalt. This pavement was spread in two courses, a binder course and a wearing surface, each 1¼" thick.

Low initial cost, low maintenance cost. Colorado 65 is now resilient, free of bumpy expansion joints, and extremely smooth to ride. It's also durable—able to give years of service at a cost below that of maintaining a concrete road.

Texaco Asphalt Cements and Liquid Asphaltic Materials offer contractors a wide choice of materials for all kinds of road building, airport runways and parking areas. If you'd like to know more about these asphaltic products, send for the two fact-filled booklets shown here: "Road Building with Texaco Asphalt" and "Plant Mixed Texaco Asphalt Pavements." Write: Texaco Inc., Asphalt Sales Division, P.O. Box 2332, Houston 1, Texas.

TEXACO ASPHALT

Chicago 4 • Denver 1 • Houston 1
Jacksonville 1 • Minneapolis 3 • Richmond 25

Why this costly confusion about compaction?

First, let's agree that the only reason for compaction at all is to produce UNIFORM and ADEQUATE consolidation in the roadbed and surface courses *before* traffic is permitted.

And, as maintenance engineers can testify, if such prior compaction is not obtained, heavy tractor-trailers will further densify the structure: ONLY, THIS COMPACTION WILL NOT BE UNIFORMLY ACCOMPLISHED! The results will be channelized deformations that lead to costly repairs—running into millions annually.

All right? Then why specify or use rollers that cannot and will not produce compactive efforts equal to or greater than those produced by today's heavy over-the-road vehicles?

Here's where the apparent confusion lies—GROUND CONTACT PRESSURES!

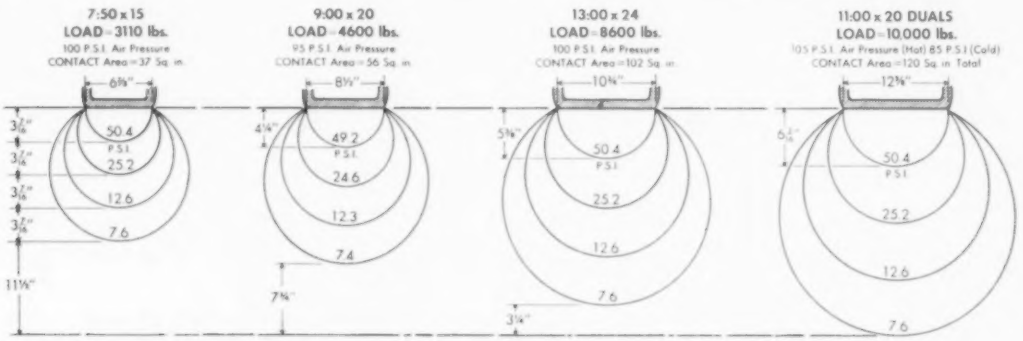
It's true that you can produce high ground contact pressures (GCP) with small size pneumatic roller tires —or for that matter, with steel wheel rollers—even greater than those produced by over-the-road vehicles. But GCP alone doesn't get the compaction job done.

To do the job, you must add these two most vital factors: WHEEL LOADS (Gross roller weight divided by the number of wheels), and GROUND CONTACT AREAS (GCA—Tire surface under load that's in contact with the ground).

If, then, you have the same GCA, GCP and Wheel Loads as over-the-road vehicles, you can expect to produce equal compaction forces.

But when you don't have this equality, the comparative diagram here shows the costly difference in compaction forces exerted.

This clearly demonstrates why post-construction compaction leading to deformations occur, doesn't it?



Be mindful, too, that "heat rise" occurs in truck tire inflation pressures after approximately the first 50 miles of high speed travel, adding another 20 lbs. psi to further increase GCP . . . and, of course, also creating an even greater surface compaction force. And anyone who has heard the dishes rattle in the kitchen when a big truck rolls by can appreciate the vibratory effect that is set up in traveling at 50-60 mph speeds; this, too, adds to the consolidation by shaking down or repositioning particles in the grade, base and surface.

So it's plain to see why a properly designed roller must handle the compaction of our modern streets and highways.

But even if all of these important reasons for choosing the proper roller were ignored, there still is this paramount benefit: The large diameter roller tire permits compaction of grade, base and surface courses without "shoving," dozing or building up materials which can slow down or even stop other work operations.

To eliminate the costly confusion about compaction, today's rollers must do the same degree of compaction as over-the-road vehicles — only, do it FIRST!

Meeting *all* the challenges of today's compaction needs is the BROS Model SP-730B self-propelled pneumatic tire roller. Now available with Air-On-The-Run,* an advance that accelerates the building up of structural strength in weak soils for grade and base compaction; adding a hitherto impossible flexibility to roller performance on surface rolling, too.

**Patent Pending*

Ask for detailed data on the statements made here. Write BROS INCORPORATED for documentaries and the name of franchised BROS Dealer and factory manager in your area.

BROS
ROAD MACHINERY DIVISION

BROS *Incorporated*

1057 TENTH AVENUE S. E.
MINNEAPOLIS 14, MINNESOTA

30-TON SELF-PROPELLED ROLLER | VIBRA-PACTOR | 25,000 LB. SELF-PROPELLED ROLLER | 10 AND 15-TON ROLLERS | SHEEPSFOOT TAMPERS | 35-100 TON ROLL-O-PACTOR

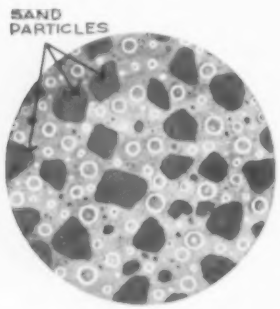
BROS Products also manufactured in Australia and Brazil

. . . for more details circle 289 on enclosed return postal card

ALPHA
BETTER CONSTRUCTION THROUGH BETTER USE OF CEMENTS
news and notes from the field

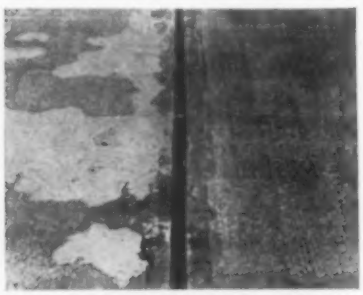
Where and How to Use Air-Entrained Concrete

Cement Plus Air



When an air-entraining admixture is introduced into a concrete mix it forms literally billions of tiny air bubbles. Air-entrainment was originally developed to make concrete more resistant to the harmful effects of freezing and thawing action. It also provides a number of desirable side effects. It is more cohesive and workable. It results in less bleeding or surface water; there is less danger of segregation and trapped air pockets and it has less tendency to dust when steel trowel finished.

Air-Entrainment Prevents Scaling



Concrete pavement subjected to severe weathering and frequent applications of salt. The unscaled pavement on the right of the expansion joint was built with air-entrained concrete. The heavily scaled pavement on the left was built with portland cement containing no air-entraining material.

During severe winters some concrete pavements have revealed surface scaling as a result of freezing and thawing and from the direct application of salt to remove ice. The extent of the scaling depends upon the amount and frequency of salt application and the quality and age of the pavement. Extensive laboratory research and field experiments show that concrete produced with air-entraining portland cement have excellent resistance to severe frost action and salt applications, provided salt is not applied too soon (never less than 6 weeks).

How Much Air

Best results with pavement mixes in which the maximum size of coarse aggregate is at least 1½ in. are obtained when the total air entrained in the concrete is as shown in the following table. For mixes in which the maximum size of coarse aggregate is less than 1½ in. the greater mortar content requires a somewhat higher total air content in the mortar.

Max. Coarse Aggregate	*Per Cent of Air*
1½ in.	5% ± 1%
¾ in.	6% ± 1%
⅜ in.	7½% ± 1%

Where to Use Air-Entrained Concrete

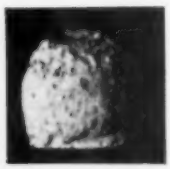
In areas where severe frost action prevails or where repeated applications of de-icing agents are made, air-entrained concrete should by all means be used. Its excellent weathering qualities, increased cohesiveness and better workability make it decidedly superior for jobs such as concrete pavements, bridge floors, large garages, warehouse loading docks, etc.

Mixing, Placing and Finishing

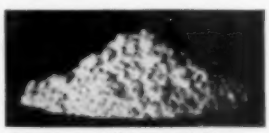
The mixing time for regular portland cement is also adequate for air-entrained cement. Inadequate mixing does not permit entrainment of sufficient air, and prolonged mixing may tend to decrease the entrained air. This makes it more important for the concrete user to be ready to place the concrete immediately after it has been mixed sufficiently to avoid prolonged mixing.

Air-entrained concrete can be readily handled and spread because the mix is very workable and cohesive, and is not apt to segregate. *Wheel, shovel or chute the mix into place, but do not flow.*

Good if vibration is used



Maximum slump



Too wet—will cause stickiness

Use a relatively dry mix with air-entrained concrete—not over a 4-inch slump on a *damp* sub-grade, and if vibration is used, the slump should not be over 1 inch. A dry mix is much easier to finish than a wet one.

Tips for Best Results

1. Be sure that air-entrained concrete is used on all exposed work where the job will be subject to freeze-thaw cycles. Air-entrainment is not a "cure-all", but is effective if the rules of good concreting are observed. It protects even some lean concrete against freeze-thaw damage.

2. Make sure that air-entrained concrete is at least 6 weeks old before subjected to salt or calcium chloride applications.

3. Be sure the air content of air-entrained concrete is sufficient (see table). If the air is too low, even air-entrained concrete can be damaged by freeze-thaw cycles—especially the first winter.

4. Encourage *closer* control of the slump for all work done in the late fall and winter—the sloppier the mix, the less effective the air-entrainment.

Reprints of the information on this page are yours for the asking.

ALPHA
PORTLAND CEMENT COMPANY
Alpha Building, Easton, Pa.
. . . for more details circle 278 on enclosed return postal card

High-gear, summer bituminous operations in Douglas County, Washington

HI-WAY SEAL COATING REPORT

How Rock Savings Paid For Spreader in One Season!

***Specification*: Box that can handle sharp turns, short street work, yet take on 10-20 miles of seal coat. *Answer*: HI-WAY Model "L" Aggregate Spreader**

"Our purchase of the HI-WAY Model 'L' spreader box, after full consideration, was governed by three factors... time, people and equipment. And, its most important role has been efficient, low-cost spreading of mineral aggregates in the covering of asphaltic shots ranging up to one gallon per sq. yd. of application. *We did the same amount of work as previously, using five trucks instead of eight; used about one-third less rock, which, by the way, paid for the box in one season; and speeded up our entire operation by about one week,*" reports Mr. Pat Thomson, County Engineer.

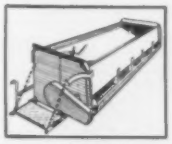
PRECISE CONTROL DOES IT

"Simple and positive lever action settings for the spreading auger permits exact control of the material and thickness of spread. The positive ejection action of the feed auger handles even oversized material that would stick an ordinary auger, not leaving the uncovered streak in the oil that you usually get. The box is self-cleaning, and the auger will bring rock out to the corners of the box until all the rock is gone. Consequently, the box does not have to be left loaded for the next spread. When it is left loaded, the box rests easily, because of its low center of gravity, on the front wheels at just the right height for easy, quick truck hitching. Gear controls are on the right side facing the back of the box, with notch adjustments from single rock up to three inch size, and remain constant without once juggling set for the spread. The box has a quick shut-off that prevents dribbling and stockpiling at the end of the spread."

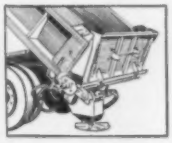
HELPS BEAT THE WEATHER

"Your representative's recommendation of this Model 'L' has given us a more productive utilization of our time: fewer dispatched trucks per hour; less repeat trips, which is important during our peak season when we work twelve-hour days. The use of less equipment, less rock and more production per hour of labor has given us a triumph over cost. Speed and efficiency of operation from this box have given us a triumph over climate, too, because we get the work done when the weather's right. This, in turn, has given us a triumph over topography in Douglas County, for we can get the light soil roads pinned down and prevent blowing."

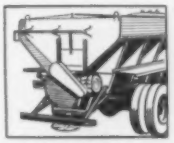
Your Nearby HI-WAY/MAN Can Demonstrate Every Type of Seal Coating Rig



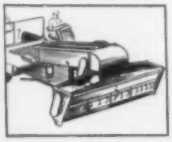
TOWED TYPE



TAILGATE



BODY MOUNTED



SELF-PROPELLED

Got a seal coating problem? Write for an answer, today!

HIGHWAY EQUIPMENT COMPANY
627 "D" Avenue, N. W., Cedar Rapids, Iowa

☐ Send me the name of the nearest HI-WAY/MAN and complete information on your seal coating line.

NAME _____

TITLE OR COMPANY _____

ADDRESS _____

CITY _____ STATE _____

PHONE _____

HI-WAY

THE FASTEST SPREADING NAME IN ALL 50 STATES

. . . for more details circle 318 on enclosed return postal card

Crush-Resistant Hose

A water suction hose designed especially for use where hose is subject to damage from truck movements is being marketed by the Goodyear Tire & Rubber Co.

Identified as Rebound because it springs back to its original shape even if completely crushed, the hose is produced in lengths of 50 ft. and in 1½ in. to 3 in. inside dia. The shape of the hose is maintained by a specially treated rope helix embedded in heavy rubber between two piles of fabric reinforcement. The helix also prevents collapse of the hose at high vacuum. The interior tube is non-porous rubber compound that resists action of sand and grit and also is impervious to mildly acid or alkaline water.

Goodyear Tire & Rubber Co., Akron 16, Ohio

For more details circle 136 on Enclosed Return Postal Card.

Crawler-Mounted Rock Drill

A new crawler-mounted rock drill with remote controls and other labor saving devices has been introduced by Joy Mfg. Co.

Designated the TDM-B1, the machine is of flexible swinging boom design, which permits hydraulic positioning of the feed and drill to put down holes in a lateral arc 45 deg. from center. This means the drill can be positioned over the side of the crawlers for

Joy's Rock Drill

line drilling in confined areas. New features on the TDM-B1 include full-range power positioning which permits changing from vertical to horizontal drilling without manual adjustment of the feed. Drilling controls are mounted on an arm that swings with the boom, yet may be adjusted to vary the distance between the drill to start a hole, then swing back, away from the drill.

Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa.

For more details circle 137 on Enclosed Return Postal Card.

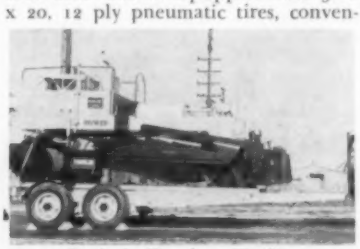
Big Tires Get New Lease On Life

This tire builder is applying a 19 ft. long strip of tread rubber in retreading a 2400-29 Firestone off-the-highway earthmoving tire. The complete rebuilding process, from buffing to building and curing the retread tire, takes about 20 hr.

Tandem Axle Trailer

A new tandem axle trailer designed to haul the Cutler Repaver has been announced by Cutler Engineering Co.

This unit has been designed to haul the 12 ton Repaver behind a conventional single axle maintenance dump truck without overloading. The tandem axle unit is equipped with 9:00 x 20, 12 ply pneumatic tires, conven-



Cutler's Tandem Trailer

tional trailer springs and axles. Air brakes are standard equipment for the unit. This trailer is equipped with a hydraulic lifting jack which receives its power from the Repaver hydraulic system. One man, it is reported, can load or unload a Repaver in fifteen minutes.

Cutler Engineering Co., 5435 W. 63rd St., Chicago 38, Ill.

For more details circle 138 on Enclosed Return Postal Card.

Truck-Mounted Slurry Machine

A new truck-mounted slurry machine that enables contractors to reseal and rejuvenate highways and roads at the rate of almost 32,000 ft. per hr. has been introduced by the Young Motor Co.

The machine is a complete unit with balanced storage for emulsified asphalt, water and aggregates. Components are stored in separate compartments, each containing a volumetric calibration for measuring the mixture-fed materials. The emulsion ejection uses a metering pump locked in ratio with a belt feeder equipped with an adjustable gate, thereby allowing the operator to control the asphalt content in the mix. Water supply is variable and is easily controlled by watching mix consistancy. An integral part of the slurry machine is a Deming 1½ L internal gear rotary pump. Operating at 200 rpm, the pump dispenses the water-like emulsion in a uniform mixture.

Young Co., Waco, Texas

For more details circle 139 on Enclosed Return Postal Card.

Enclosed Vibrating Screens

New fully-enclosed models of Deister vibrating screens have been announced by Deister Machine Co. Designed for use in hot-mix asphalt plants and cement operations where extremely dusty conditions prevail, enclosures can be furnished on any screen in the Deister line.

The new enclosure design is said to provide maximum protection against dust and still afford ready accessibility to all working parts, including spring and rubber mounts and snubber assembly. Panels are fabricated of heavy-

Deister's Enclosed Screen

gauge steel. Held securely in place by swing bolts, they can be removed in a matter of seconds.

Deister Machine Co., 1933 E. Wayne St., Fort Wayne 4, Ind.

For more details circle 140 on Enclosed Return Postal Card.

Heavy Duty Roto-Trowel

A new heavy duty troweling machine, model G34-4C HD Roto-Trowel is being marketed by the Stow Mfg. Co.

The G34-4C HD features a new heavy duty sliding sheave type clutch which gives smooth clutching, eliminates grab and results in a slow even start. With this clutch, belt life is increased since there are no belt stretching problems. An important safety feature of this clutch is the manual clutch control that stops the blades from rotating the instant the operator lets go the handle but without stopping the engine. The device has a non-rotating, stationary guard ring which protects the blades and supporting

Stow's 4-5 hp. Trowel

arms from damage that might occur from hitting obstructions and enables the operator to work right up to walls. The machine has a variable pitch adjustment which allows the operator to adjust the pitch of the blades while the machine is in motion. It is furnished with four 6 x 10 in. finish blades and four 8 x 10 in. float blades. Both float and finish blades are reversible for double life.

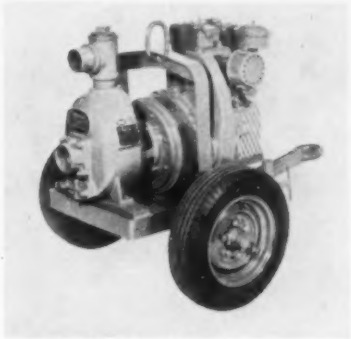
Stow Mfg. Co., 65 Shear St., Binghamton, N. Y.

For more details circle 141 on Enclosed Return Postal Card.

Diesel Powered Centrifugal Pumps

A series of 7 new air-cooled, diesel powered, self-primed centrifugal pumps have been announced by Rice Pump & Machine Co.

The manufacturer's new diesel-powered line is available with 2 to 6 in. openings. Capacities range from approximately 15,000 to 90,000 ghp. The diesel engines are 4 cycle, air-cooled,



Rice's Centrifugal Pump

crank-start types with electric starters as optional equipment. Controlled weights throughout the over-all design permit the use of high-speed trailers with 4.00 x 12 and 5.90 x 15 pneumatic tired wheels and tow tongues. Skid and conventional wheel mountings are also available.

Rice Pump & Machine Co., Belgium, Wis.

For more details circle 142 on Enclosed Return Postal Card.

Spray Bar Weight Control

The development of a new method of control of spray bar height on their bituminous "Black-Topper" distributors has been announced by E. D. Etnyre & Co.

The new mechanism has been developed to eliminate the problem of spray bar height differences which vary according to the amount of materials in the distributor tank. Usually, as bitumen is being pumped from the tank during spraying, the truck chassis frame rises as weight is reduced and the spray bar rises along with it. The steady decreasing weight after results in a continually changing spray bar height during the operation.

The "bar-Hite" control utilizes a linkage and cable mechanism attached between the truck chassis springs and the spray bar. This maintains a constant height of the spray bar above the road regardless of the amount of asphalt in the distributor tank. Because this control does not require a spring and caster, it is not affected by stones in the road bed or unevenness of the surface.

E. D. Etnyre & Co., Oregon, Ill.

For more details circle 143 on Enclosed Return Postal Card.

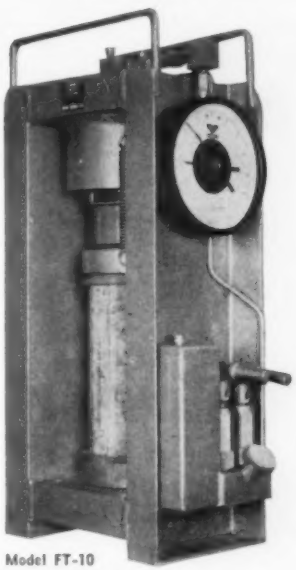
FORNEY

CONCRETE TESTERS

KNOWN THE WORLD OVER

The

"JOBSITER"



Model FT-10

LOWEST priced tester with high priced features

- 250,000 lb. Load Rating
- Designed to Protect Operator from Flying Fragments
- Fully Protected Gauges Equipped with Instant Connectors

Accessories available for:

- ★ 6" x 12" cylinders
- ★ 8" x 8" x 16" blocks
- ★ 6" x 6" beams
- ★ 6" x 6" cubes
- ★ 2" x 2" cubes
- ★ Compression and modulus of rupture of brick

"JOBSITER" is only one of a complete line of concrete testing machines. When better low priced testers are built—Forney's will build them.

FORNEY'S, INC.
Tester Division
P. O. Box 310
New Castle, Pa., U.S.A.
Phone OLiver 2-6611
Cable: Forney's, New Castle

. . . for more details circle 305 on enclosed return postal card

Main assignment for four Michigan Dozers on Utterback's 3,000,000 yd, $5,000,000 highway contract: spreading up to 18,000 cu yds of scraper and truck fill per day.

Today: *4 Michigan Dozers for this major Midwest contractor.* Tomorrow: *15*

EACH REPLACES 2

At first glance, this *looks* like a typical big-job spread of equipment. Twenty tractors. Fifteen self-propelled scrapers. Sixty dump trucks. But then you look again. Four of the tractors are on rubber. All Michigans.

"And come back in a few years," says the contractor, Chelsea Utterback, Mt. Pleasant, Michigan, "and *almost all* our tractors on the grade will be rubber-tired Michigans!"

The reasons are pretty obvious. The Michigan units are *fast*—dozing and push-loading at speeds up to 6 mph, running job-to-job at speeds up to 28 mph. *They're economical*—on the basis of Utterback's experience, tires outlast tracks in sand "at least 6 to 1." *They help compaction.* And Michigans come in a *range of sizes* to match the workload. Utterback Construction Company owns 162 and 262 hp units; 375 and 600 hp models are also available.

Speedy 262 hp unit also increases push-loading output

Utterback's 262 hp Model 280 often handles push-loading of 18-yd scrapers. Load time in typical sandy material averages 40 seconds. Load size averages 13 to 15 pay yds. "Overall scraper cycle time is further reduced," says Mr. Utterback, "by the Michigan's ability to quickly boost each pan out of the pit —and by its high-speed return. On cycles of 1000 to 2000 ft, we actually get an *extra load per scraper per hour!*"

Another major production advantage can be noted on the fill. Here, a Model 280 and two Model 180 Michigans spread 14,000 to 18,000 pay yards of sand and clay per day. Their dozing speed averages 7 to 12 mph. Moreover, compaction after the several passes necessary for normal dozing often reaches 98% (Proctor). "*On many jobs, each Michigan Tractor Dozer thus turns loose from fill assignment two crawlers and a roller,*" reports Mr. Utterback.

Job-to-job at 28 mph

On the contract shown—9 miles of four-lane bypass superhighway around Midland, Michigan—the Model 180 Tractor Dozers are being used alternately on two widely-separated fill sec-

. . . for more details circle 292 on enclosed return postal card

Utterback's biggest Michigan Dozer, a 262 hp Model 280, often push-loads scrapers Loading sand to 18 yd spill-point takes high-speed unit average of only 40 seconds.

CRAWLERS, 1 ROLLER

tions. Self-powered truck-like speed saves valuable time. The machines also backfill drainage structures and handle finish-grading.

"By working a 162 hp Model 180 *two hours* overtime on backfilling, we accomplish work *it would take a crawler all day to do*," the contractor states.

Overtime replaces double-shifting

In addition to observing all the standard rules for construction equipment servicing, Chelsea Utterback has a notable one of his own. Each machine is assigned an individual operator, and when double-shift operation ordinarily would be required, that operator stays with his machine for a limited number of overtime hours. Mr. Utterback is convinced by his production records that his system pays off.

He's equally convinced, from the same records, that so far as Dozers are concerned, dependable Michigans pay off "most of all."

Note how high operator rides above ground . . . out of the dust and with excellent view of blade. Despite its height, Dozer has very low center of gravity.

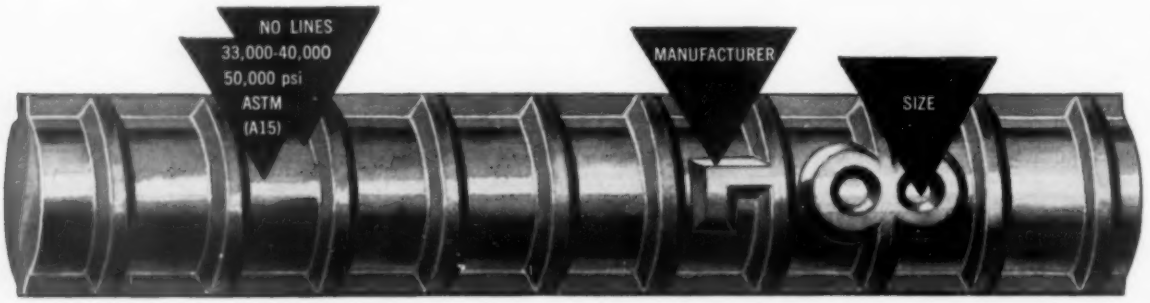
Michigan is a registered trademark of

CLARK EQUIPMENT COMPANY
Construction Machinery Division

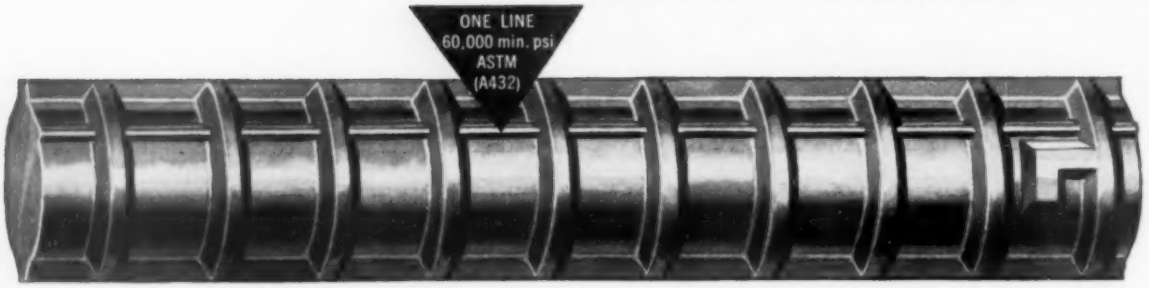
CLARK® EQUIPMENT

2497 Pipestone Road
Benton Harbor 40, Michigan

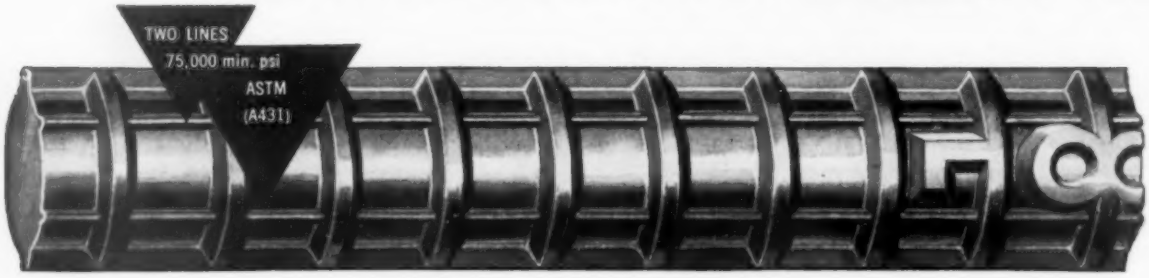
In Canada:
Canadian Clark, Ltd.
St. Thomas, Ontario



ROLLED-IN MARKINGS



SHOW SIZE AND STRENGTH



OF EVERY LACLEDE STEEL REINFORCING BAR

fast, easy identification saves construction time and cost

Metallurgical research has developed high-strength steels that substantially improve the efficiency and economy of reinforced concrete design — saving as much as 15% of the total construction cost of the structure.

Laclede now brings you this steel reinforcement in new, easy-to-identify bars that can be used with assurance under the Ultimate Strength design methods of the A.C.I. building code. With this positive identification, the worker can quickly find the right bar specified for the job. The clear marking of the grade of steel minimizes the need for inspection and testing.

Specify these time-saving, money-saving Laclede bars for your next construction job.

LACLEDE STEEL COMPANY

QUALITY STEEL FOR INDUSTRY AND CONSTRUCTION

ST. LOUIS 1, MISSOURI

Steel

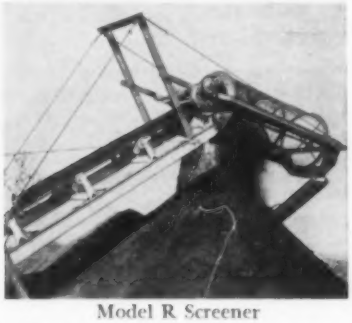
6104

. . . for more details circle 334 on enclosed return postal card

Rotary Screener Attachment

A new "Model R" rotary screener attachment has been announced by the Lindig Mfg. Co., Inc.

An accessory for the Model L soil shredder, it is available in 25 to 60 cu. yd. per hr. units. The screener, reports the manufacturer, makes it possible to combine 4 jobs into one operation, with just one operator . . . feeding, shredding, screening and loading. It



Model R Screener

is useful when preparing materials for top dressing and seeding and can remove stones, roots, wood chips and similar unwanted materials. The device mounts on the loading conveyor and is driven from the loading conveyor head shaft, through a chain drive and right-angle gear speed reducer.

Lindig Mfg. Co., Inc., Dept. A, 1875 W. County Rd. "C", St. Paul 13, Minn.

For more details circle 144 on Enclosed Return Postal Card.

Dump Trailer Meets Weight Laws

A new trailer concept designed to let trailer owners meet axles-load restrictions in all 50 states and still carry maximum payload at all times was recently introduced as a combination effort of Spencer-Safford Loadcraft, and the Equipment Div. of Young Spring & Wire Corp.

Called the Loadcraft-Daybrook "Hydra-Shift" Pay-Pac dump trailer, the new hauler has a 24 ft. aluminum or steel body that can be hydraulically shifted to any position on its extra-length 35 ft. chassis to conform to varying axle-load relations or bridge formulae as it passes over state borders. In

Hydra-Shift Trailer

operation, the new Pay-Pac is said to not only match every state's weight regulations without changing equipment or load-splitting, but it allows complete interchangeability of tractors, whether single or tandem drive.

One extra-size Daybrook hydraulic hoist positions the load and dumps the body. The double-acting, telescopic hoist is mounted reverse of usual procedure, with the small end attached to the chassis and the large end of the body.

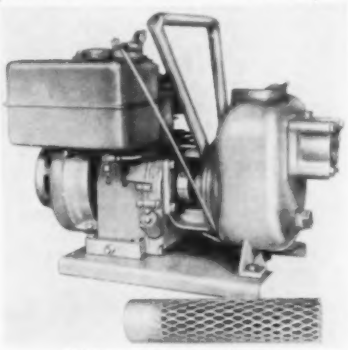
Equipment Div., Young Spring & Wire Corp., Bowling Green, Ohio

For more details circle 145 on Enclosed Return Postal Card.

Centrifugal Pump

A new pumping set called the Aquamaster has been announced by the Universal Motor Co.

This is a 2 in. centrifugal pump driven by a 3 hp. Briggs and Stratton air cooled engine making it a light-weight portable unit suitable for a variety of



Universal's 2 In. Pump

uses. It is claimed simple to operate and simple to take down or assemble, making adjustments and repairs a comparatively easy task. The objective in designing the pump has been to produce a pump that will last longer and cost less to operate states Universal.

Universal Motor Co., 454 Universal Dr., Oshkosh, Wis.

For more details circle 146 on Enclosed Return Postal Card.

Protective Epoxy Coating

A newly developed equal epoxy protective coating for asphaltic and concrete surfaces has been developed which is reported resistant to oil, grease, gasoline, salt solutions and water.

Known as Pre-Seal 830, the material is an anti-skid coating and has good resistance to weathering and abrasion. It is a 100 percent solids material that may be sand loaded for filling spalled areas. Application time is 30 to 45 min. with a 8 hr. cure time at 77 deg. F for moderate use. Coverage is from 100 to 125 sq. ft. per gal., dependent on surface conditions and method of application.

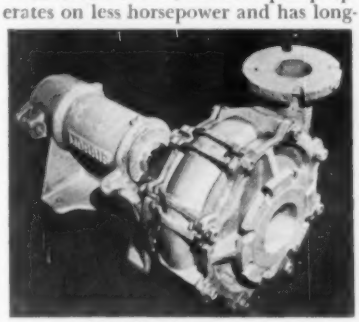
Coast Pro-Seal & Mfg. Co., 2235 Beverly Blvd., Los Angeles 57, Calif.

For more details circle 147 on Enclosed Return Postal Card.

New Slurry Pumps

By approximating the efficiencies of clear water pumps, the new Morris "JC" slurry pump has achieved a performance in slurry pumping jobs where both abrasives and corrosive substances are present.

According to the manufacturer, Morris Machine Works, the new pump operates on less horsepower and has long-



Morris Slurry Pump

life wearing parts. The new line has standardized components which allow a pump to be altered for repairs or quick changeover to another installation or application. Depending on the application, they are available in medium, hard or extremely hard metal casings, impellers and liners. Shaft sleeves are stainless steel. The pump employs heavy-duty thrust and radial ball bearings.

Morris Machine Works, Baldwinsville, N.Y.

For more details circle 148 on Enclosed Return Postal Card.

Plowing Disc

The new Ferguson plowing disc, manufactured by Shovel Supply Co., Inc., is reported designed for heavy work—cutting, plowing, aerating and mixing soil—on earthfills for dams, airports and highways.

The extra heavy frame, oversize Timken bearing, triple grease seals and high carbon notched discs make it suit-

Ferguson Plowing Disc

able for the toughest jobs. It is manufactured with discs 28 to 32 in. in dia.; weight ranges from 10,500 to 12,500 lb. The hinged type can be opened and closed from the tractor operator's seat. The rigid offset type can be equipped with rubber-tired transportation wheels.

Shovel Supply Co., Inc., 4900 Hines Blvd., Dallas, Texas

For more details circle 149 on Enclosed Return Postal Card.

Electric Start Engines

The 9.5 hp. K241, newest in the Kohler line of air-cooled engines, now is available in an electric start model, the K241S.

Electrical equipment on the K241S includes a 12 volt combination starter-generator, a battery charging current regulator and a control panel with ignition switch and starter button. The

Kohler's Electric Start Engine

unit is available with either magneto or coil ignition. Compact, lightweight and rugged, the new engine is a single-cylinder, 4-cycle machine of cast iron construction and larger bore, short stroke design. Features of the engine include anti-friction ball bearings on the crankshaft and spark advance mechanism.

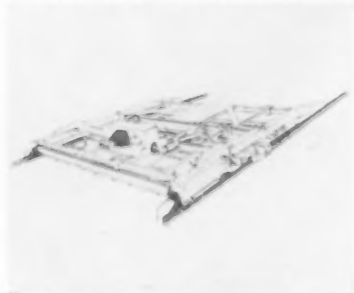
Kohler Co., Kohler, Wis.

For more details circle 150 on Enclosed Return Postal Card.

Road-Building Machine

The addition of a new precision Spreader-Finisher-Float machine to an existing line of road-building equipment has been announced by the construction machinery section of Chain Belt Co.

The new machine is reported capable of paving a road in one pass without any need for back up. It requires only one operator and only one power plant to service. Combined spreading, finish-



Rex' Road-Building Machine

ing and float operations of the new Rex unit insure high-quality slab density and overall accuracy to meet the most exacting specifications. It is designed to hold close tolerance. The spreader-finisher-float provides positive spreading action and traction through instant screw control. Controls are grouped for operating ease and the operator has clear view of the screw and strikeoff through an open steel floor grate. The telescopic frame adjusts in widths of 20 to 26 ft.

Chain Belt Co., Milwaukee 1, Wis.

For more details circle 151 on Enclosed Return Postal Card.

Redesigned Motor Scraper

The TS-160 motor scraper—smallest in the Allis-Chalmers all hydraulic line, has been redesigned and restyled to increase the unit's capacity to 8½ struck and 11 cu. yd. heaped and the payload to 13 tons.

It is powered by Allis-Chalmers 155 hp. supercharged diesel engine and maintains a highly favorable 18.2 hp. to-struck yardage ratio. It also features all-hydraulic operation and double-acting steering jacks with multiple links to give the unit full power steering over the entire steering range. A 90 deg., non-stop turn can be made in less than 25 ft., states the company. Low, wide bowl design, coupled with double-acting bowl lift jacks facilitate fast loading. The unit also has the "Kon-Tork" differential which automatically controls the amount of torque delivered to each drive wheel in relation to traction requirements. It consists of only five moving parts for simple, dependable operation and provides maximum tractive effort in all types of material and conditions.

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

For more details circle 152 on Enclosed Return Postal Card.

Scaffold Slide Fastener

A new, rugged, free-acting slide type fastener, the Super-Lock, is now being manufactured by Superior Scaffold Co. for use with scaffold and heavy duty shoring employed on bridges and heavy construction jobs.

Advantages claimed for the new slide fastener are easier and faster set-ups, versatility and trouble-free long life. The unit has a full ½ in. dia. stud

Superior's Slide Fastener

and a welded saddle which holds stud and slide in alignment. Older and more conventional types of scaffolds may be modernized with the new device.

Superior Scaffold Co., 5624 Banfield Ave., Culver City, Calif.

For more details circle 153 on Enclosed Return Postal Card.

Extendable Flat Trailer Line

A newly developed extendable high flat trailer line, Model HFT 25DX, has been announced by the Rogers Bros. Corp.

The new unit is equipped with 10.00 x 15.12 ply nylon tires and has a drop deck which produces a 44 in. deck height. The lower deck height will allow greater load heights without special hauling permits. The lower center

Rogers' Extendable Trailer

of gravity should reduce sway. A choice of rear axle suspensions is available: spread tandem; sliding tandem; or triple-axle tandem. It is reported to haul bulky loads with the deck in closed position of 35 ft. and haul long, unwieldy loads with the deck in the open positions of 45 to 55 ft.

Rogers Bros. Corp., Albion, Pa.

For more details circle 154 on Enclosed Return Postal Card.

Water Storage for Mixers

Problems of water storage and dispensing on truck-mounted concrete mixers are reported solved by a new fibreglass tank now being produced by Apex Reinforced Plastics.

Inherent characteristics of the laminated fibreglass offer realistic solutions to both problems. Fibreglass tanks save weight of steel vessels of comparable size. This weight savings on the water tank can then be converted directly into increased payload. Natural translucence of the fibreglass makes the fluid level within the tank visible at all times. Scribed calibrations on the tank surface are adequate for volume computations and general metering. The reinforced plastic tanks are resilient, tough, dent proof and highly resistant to failure from vibration-induced fatigue.

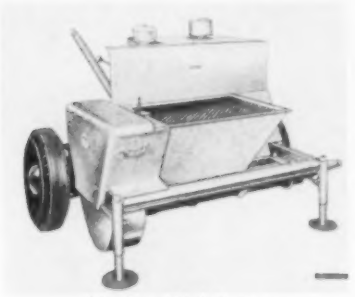
Apex Reinforced Plastics, Washington & Elm St., Cleveland 13, Ohio

For more details circle 155 on Enclosed Return Postal Card.

Concrete Placing Machine

A new, all-purpose concrete placing machine, the Uni-Cretor, was announced by Airplaco. The new unit is reported capable of performing several major job operations.

Wet gunning is accomplished by pumping pre-mixed wet concrete through flexible rubber hose to an Airplaco nozzle. High velocity air is injected at the nozzle to atomize the material and increase the gunning velocity. Concrete placing with the Uni-Cretor, features a new method of



Airplaco Uni-Cretor

placing concrete with ¾ in. minus aggregate. By using the hose to discharge the concrete, flexibility is increased and labor is greatly decreased. Hoisting and placing mortar and grout at higher capacities is made possible with the same machine, which is said to hoist material up to ten stories and more than 300 ft. horizontally. High and low pressure grouting is another major operation accomplished. It is said to pump all standard grout mixes at rates up to 20 cu. yd. per hr.

Air Placement Equipment Co., 1000 W. 25th St., Kansas City 8, Mo.

For more details circle 156 on Enclosed Return Postal Card.

Gutter Broom Refills

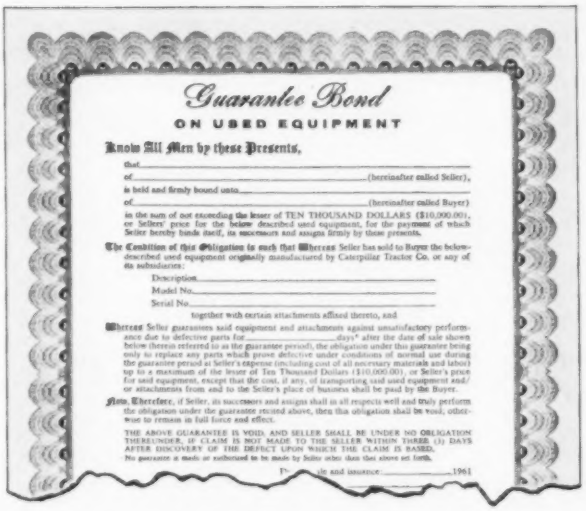
Elimination of hours of hand labor in refilling worn gutter brooms is now possible because of a new premade gutter broom section developed by the Newark Brush Co.

The brush section fits in a simplified aluminum housing developed specifically for this purpose. The premade brush section is bolted between the housing and a retaining ring with six bolts. Using only a socket wrench, worn gutter broom sections can easily be removed and a new section bolted in place in a matter of 10 to 15 min. Removal and replacement of gutter brooms can thus be accomplished in minutes. The special housing is made of aluminum to avoid overloading the sweeper. Design of the housing imparts the traditional gutter broom shape to the premade brush section and provides pockets in the brushing surface which are useful in removing large objects from the gutters.

Newark Brush Co., 260 Michigan Ave., Kenilworth, N. J.

For more details circle 157 on Enclosed Return Postal Card.

This Bond Is an Investment in You



Guarantee Bond

ON USED EQUIPMENT

Know All Men by these Presents,

that _____

of _____ (hereinafter called Seller),

is held and firmly bound unto _____

of _____ (hereinafter called Buyer)

in the sum of not exceeding the lesser of TEN THOUSAND DOLLARS ($10,000.00), or Sellers' price for the below described used equipment, for the payment of which Seller hereby binds itself, its successors and assigns firmly by these presents.

The Condition of this Obligation is such that Whereas Seller has sold to Buyer the below-described used equipment originally manufactured by Caterpillar Tractor Co. or any of its subsidiaries:

Description _____

Model No. _____

Serial No. _____

together with certain attachments affixed thereto, and

Whereas Seller guarantees said equipment and attachments against unsatisfactory performance due to defective parts for _____ days* after the date of sale shown below (herein referred to as the guarantee period), the obligation under this guarantee being only to replace any parts which prove defective under conditions of normal use during the guarantee period at Seller's expense (including cost of all necessary materials and labor) up to a maximum of the lesser of Ten Thousand Dollars ($10,000.00), or Seller's price for said equipment, except that the cost, if any, of transporting said used equipment and/or attachments from and to the Seller's place of business shall be paid by the Buyer.

Now, Therefore, if Seller, its successors and assigns shall in all respects well and truly perform the obligation under the guarantee recited above, then this obligation shall be void, otherwise to remain in full force and effect.

THE ABOVE GUARANTEE IS VOID AND SELLER SHALL BE UNDER NO OBLIGATION THEREUNDER, IF CLAIM IS NOT MADE TO THE SELLER WITHIN THREE (3) DAYS AFTER DISCOVERY OF THE DEFECT UPON WHICH THE CLAIM IS BASED.

No guarantee or warranty is authorized to be made by Seller other than that above set forth.

Dated at _____ this _____ day of _____, 1961

Signed by your Caterpillar Dealer, this bond gives you up to $10,000 worth of machine dependability

BONDED BUY

Bonded Buy means guaranteed machine dependability. You can get a completely-checked, used Cat-built machine that has the Cat Dealer's confidence and guarantee, PLUS this bond from Lumbermens Mutual Casualty Company that backs up your machine with as much as $10,000 worth of parts and labor for the period you and the dealer agree upon.

See your dealer. Read the bond. Check the details. This guarantee can apply on your next used machine. And you pay no extra premium for this assurance. Dependable Bonded-Buy machines are priced right—and your Cat Dealer offers terms to match your needs. Call him or see him soon. Do business with the man whose business is built on dependability.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

. . . for more details circle 290 on enclosed return postal card

This is the blade to cut your costs

. . . because CF&I Cutting Edges are scientifically designed and carefully manufactured to give long, trouble-free service on dozers, scrapers, snowplows, graders and allied equipment. Made of special analysis steel, these rugged, dependable-service blades have the endurance and long-wearing qualities that assure the greatest number of operating hours per dollar of blade cost.

To meet your requirements, whatever they may be, CF&I maintains nation-wide inventories of many different types of blades and cutting edges through its many distributors. For complete details and quick, dollar-saving delivery, contact your distributor or your nearest CF&I sales office.

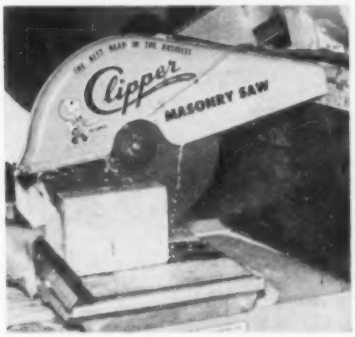
The Colorado Fuel and Iron Corporation
Denver • Oakland • New York
Sales Offices in All Key Cities

. . . for more details circle 296 on enclosed return postal card

Break-Resistant Cutting Blade

A new addition to the series of Blue Bond break-resistant abrasive blades has been announced by Clipper Mfg. Co.

Designed especially for cutting lightweight block, dry press refractories, and softer types of stone, the MR 824 features Leno-Weave fiber glass reinforcing. It is a patented manufacturing



Clipper's Cutting Blade

process that weaves layers of tough, flexible glass cloth into each blade. The reinforcing is used in the same manner that steel reinforcing rods are used in concrete. The silicon carbide particles flow through the reinforcing mesh, protruding beyond its surface. This protects the fiber glass cloth from becoming thin from side wear. The original break-resistant qualities are maintained throughout the entire life of the blade.

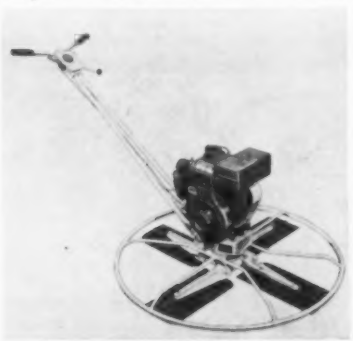
Clipper Mfg. Co., 2800 Warwick, Suite 198, Kansas City 8, Mo.

For more details circle 158 on Enclosed Return Postal Card.

Trowel Blade Control

A new 44 in. trowel with counterbalanced blade control has been developed by Kelley Machine Div.

The four blades are easily pitch-controlled while they are turning by moving a finger-tip lever on the handle, states the manufacturer. The combination of four blades and a new flat-locked floating position assures flat, level concrete work. Also, an extra high blade pitch stop permits burn-type finishes. The apparatus has a compact silhouette with a low center of gravity for easy operation without gyrating. Heavily constructed for severe usage, the Kelley 44 in. power trowel is recommended for fast, smooth economical floating and finishing of medium-to-large areas.



Kelley's Trowel Blade Control

Kelley Machine Div., 285 Chicago St., Buffalo, N. Y.

For more details circle 159 on Enclosed Return Postal Card.

Insulation for Highway Bridges

Chemical research has produced a new type of foam-plastic insulation for highway bridges that normally become dangerously icy even when their approach roads are still safe.

When sprayed to the underside of highway bridges, the insulation is also expected to reduce the rapid deterioration of bridge decks caused by frequent freezing and thawing or by the use of large amounts of de-icing salts. Urethane bridge insulation, developed and test-proved by Barrett Div. of Allied Chemical Corp. is the first insulation marketed especially for highway bridges, according to a statement by that company. When the underside of a bridge is insulated with urethane, it has practically the same rate of heat loss as a road surface. Therefore, it will not ordinarily become iced before the road pavements approaching either side of the bridge.

Barrett Div., Allied Chemical Corp., Byoir & Assoc., Inc., 800 Second Ave., New York 17, N.Y.

For more details circle 160 on Enclosed Return Postal Card.

NOW! Get Circulation Where It Counts . . .

Roads and Streets' Clearing House REACHES THE MARKET'S HEART

INDIVIDUAL CONTRACTORS
CITY, COUNTY ENGINEERS
CITY, COUNTY OFFICIALS

Long a leader serving the heavy construction and associated fields, ROADS AND STREETS' "cream" circulation goes to the important men in the business. They are the men, who directly or indirectly influence the purchase and sales of new and used equipment and supplies.

When you are "in the market" reach the logical buyer or seller quickly—at a reasonable cost to yourself.

Use the Clearing House!

Just clip the coupon below and attach your copy.

CLIP YOUR AD COPY TO THIS HANDY ORDER FORM AND MAIL TO

CLEARING HOUSE SECTION ADVERTISING RATES
TRANSIENT RATE — $11.00 Per Column Inch Per Insertion

CONTRACT RATES — Based on use of total space indicated within yearly period.

12 in.	$10.45
24 in.	10.35
36 in.	10.00
48 in.	9.90
60 in.	9.80
90 in.	9.65
120 in.	9.50
180 in.	9.25
360 in.	9.00

COPY AND CLOSING DATES
Final closing date is the Fifteenth of the preceding month. Magazine is issued 1st of publication month. If proof is desired, copy must be received 5 days preceding closing date.

CLEARING HOUSE SECTION
ROADS AND STREETS
22 W. MAPLE STREET, CHICAGO 10, ILL.

Please Insert the Attached Advertising Copy in the Next Issue of ROADS AND STREETS to Occupy_____Inches of Space.

Number of Insertions_____

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

TELL US WHAT YOU HAVE TO OFFER AND WE'LL SET UP THE AD FOR YOU.

CLEARING HOUSE SECTION

Rotary Impact Drill

Designed to eliminate costly, time-consuming set-ups and the moving of heavy equipment to drill holes in concrete, a new product, Roto-Imp JL-200, is being made by the Bill Jack Scientific Instrument Co.

Precision engineered and manufactured, this rotary impact drilling tool offers contractors and maintenance

Waterless Drill

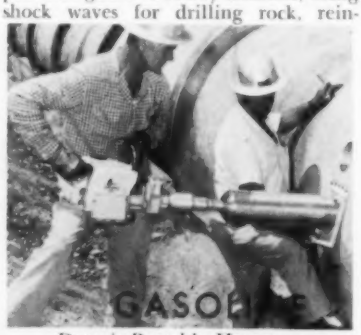
men a fast, waterless method of cutting holes in concrete. Rotating at 1200 rpm. and simultaneously delivering 7200 impacts per minute at the core drill bit tip, the device shatters both gravel particles and rock aggregates as it cuts holes from 1⅛ to 6 in. dia. There is no fracture damage to the surrounding areas whether drilling in common brick, cement pipe, cement block or concrete, states the company. It is designed to bite through rebar from ⅜ to ¾ in. dia. Extra ruggedly constructed, with a 1½ hp. motor and a heavy gear train designed for continuous use, the machine weighs only 30 lb. and is highly portable.

Dept. F-47, Tool Div., Bill Jack Scientific Instrument Co., Solana Beach, Calif.

For more details circle 161 on Enclosed Return Postal Card.

Portable Rotary Hammers

Because of the demand for independent power on location, a new portable gasoline rotary hammer, using shock waves for drilling rock, rein-



Demo's Portable Hammers

forced concrete or masonry has been manufactured by the Demo Tool Corp.

Powered by a heavy-duty McCulloch gasoline engine, the new model develops 40,500 shock waves and 8,250 impacts per minute. The portable electric rotary hammers are powered by 115 volt AC or DC motors, which require no transformers or rectifiers. The hammers drill ½ in. to 8 in. holes. One-man operated, it requires little pressure for difficult overhead, horizontal or angle jobs and is stressed to withstand 5,000 lb. side-pressure. Precision engineered and fabricated from quality, heat-treated steel, all five models have free-flowing anvil action.

Demo Tool Corp., 1001 Colorado Ave., Santa Monica, Calif.

For more details circle 162 on Enclosed Return Postal Card.

Pocket Penetrometer

The availability of a newly improved pocket penetrometer was announced by the Testlab Corp.

The pocket device is designed to be used as a field check for classifying various soil types by inserting the tool into the soil and measuring the resistance to penetration. It may be used to determine the approximate degree of compaction in agricultural studies, estimating degree of chemical solidification, checking bituminous groove coatings and rate of hardening of concrete. The calibrated spring is completely enclosed in the body and cannot come in contact with soil unless it is assembled. This assembly can be accomplished by removing one screw.

Testlab Corp., 3398 N. Milwaukee Ave., Chicago 41, Ill.

For more details circle 163 on Enclosed Return Postal Card.

New Forged Shovels

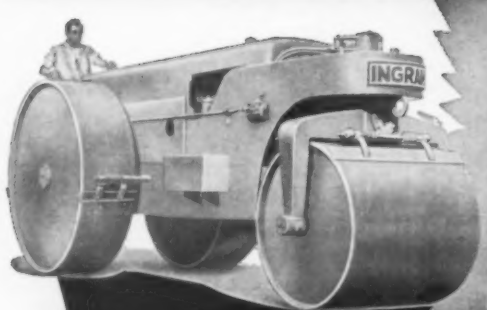
A new line of forged shovels by the Wood Shovel & Tool Co. has an incorporated I-beam reinforcement which prevents handle breakage.

The shovel blades are of high carbon steel. The socket is modified to receive a straight chucked handle into which is slotted a reinforcing I-beam support.

Wood Shovel & Tool Co., Piqua, Ohio

For more details circle 164 on Enclosed Return Postal Card.

INGRAM ROLLERS



FEATURING . . . REVERS-O-MATIC DRIVE

FOR RENT NEW INGRAM ROLLERS 5 to 12 TONS TANDEM AND 3-WHEEL

Acme IRON WORKS
CULEBRA AVE. AT EXPRESSWAY N. W.
P.O. BOX 2020 • SAN ANTONIO 6, TEXAS

ROTARY SWEEPER BROOMS
WE MANUFACTURE

- Austin - Western
- Cub Low Boy
- Det-Harvester
- Fordson
- Ferguson
- Grace
- Guttersnipe
- Hough
- Huber
- Jeep-Willy's
- Littlefords
- Little Giants $69.50 Up
- Moll (M.B.)
- Blumberg
- Ram
- Rosco
- Spearswell
- Tampo
- Wayne Model 480
- And Many Others

Special Cores made to order

• COCOA ROLLER MATS •
Drag Broom Levelers
Street Push-Concrete Brooms
RE FILLING BUILDING PAIRS
KENNEDY'S
VAN BRUSH MFG. CO. INC
2728 McGee Trfwy. Kansas City, Mo.

FOR SALE

10—15 cu. yd. Euclid Mod. 63TD End Dumps	$24,000.00 ea.
5—15 cu. yd. Euclid Mod. 46TD End Dumps	24,000.00 ea.
10—30 cu. yd. Athey Mod. PW20 Bottom Dump Trailers only	13,000.00 ea.
12—30 cu. yd. Mod. MX30 Southwest Bottom Dump Trailers	5,000.00 ea.
10—DW20 Cat Tractors w/30 cu. yd. Mod. PW20 Athey Bottom Dump Trailers	27,000.00 ea.
8—Mod. LRVX Mack Tractors w/30 cu. yd. Mod. 137W Euclid Bottom Dump Trailers	36,500.00 ea.
4—D9 Cat Tractors w/PCU's & Dozers, 18A Series	26,500.00 ea.
8—D8 Cat Tractors w/PCU's & Dozers, 14A Series	16,500.00 ea.
2—Mod. 33LDT Euclid Pneu. Tired Scraper Units	27,000.00 ea.
10—DW20 Cat Scraper Units w/Modified Bowls	27,000.00 ea.
4—6′ x 6′ "Special" D.D. Sheepsfoot Tampers, U.S.B.E. Specs.	7,500.00 ea.
1—6′ x 16′ Koehring Smooth Faced Sealing Roller, 50,000	3,500.00
2—Mod. 12 Cat Motor Patrols, Cabs & Hyd. Shift Mole Boards	8,000.00 ea.
2—Mod. 200 Rex Double Pumpcretes, Electric	7,500.00 ea.
2—60″ x 20′ Link Belt H.O. Mang. Apron Feeders w/Drives	12,500.00 ea.
2—30″ x 60″ Single Roll Gruendler Crushers w/Drives	9,500.00 ea.
1—6′ x 12′ Tyler F800 Single Deck Screen w/Drive	6,000.00
Approx. 2 Miles 42″ and 48″ Channel Frame Conveyor System in Flights of 150′ to 1885′	Price on Application

CALL, WIRE or WRITE for Complete Bulletin!

TRINITY DAM CONTRACTORS

10 West Orange Avenue — So. San Francisco, Calif.

Phone: PLaza 6-0300, Ext. 279

SURPLUS EQUIPMENT

Cedarapids Super Commander Crusher with D353 Caterpillar Power Unit.

Barber-Greene 845 Continuous Asphalt Plant with Boiler, Fuel and Asphalt Tanks.

HL Hough Loader with 1-yard Bucket.

Sauerman Scraper Unit Complete with Bucket, Cables, Mast, American Double Drum Hoist with 150 horsepower electric 440 3-ph. Motor, and Mast Blocks.

International Harvester TD-18 Dozer.
4 ea. 7 x 10 6 cu. yd. Single Post Webber Dump Beds.

1 ea. Model TF Wisconsin Air Cooled Engine—approximately 15 horsepower.

2 ea. Jeep Gasoline Engines.

1 ea. 4-cylinder Wisconsin Air Cooled Gasoline Engine, 20 horsepower, directly connected to 1½" high pressure centrifugal Pump.

1 ea. LeRoi Gasoline Engine.

ASPHALT PAVING CO.
9655 W. Colfax Ave.
Denver, Colorado
Ph. Alpine 5-6561

FOR SALE

COMPLETE CONCRETE PAVING SPREAD

1. 34E Koehring Mixer
1. C. S. Johnson Automatic Bins and One Step Batcher
1. Quad City Slip Form Paver w/Maginniss Vibrators
1. 1 yd. Crane w/2 yd. Clam Shell

REPLY
P. O. Box 275
Albuquerque, New Mexico

FOR SALE

1—Fordson Major Diesel Tractor with backhoe and front end loader.

1—International Model 350 Tractor with backhoe and front end loader.

1—Gar Wood "Buckeye" Model 301 Ditcher, 5'6" deep, 24" wide, gas engine.

1—LeTourneau Westinghouse Model B Tournapull powered by Cummins diesel engine mounted on 27:00x33 tires. Very low time since complete factory approved reconditioning.

2—LeTourneau Westinghouse Model C Tournapulls, Cummins engines, Fullpak scrapers, 26.5x25 tires. Completely reconditioned.

1—LeTourneau Westinghouse Model C Tournapull, GM 6-71 diesel engine, P19 scraper, rubber fair - good operating condition.

1—LeTourneau Westinghouse Model C Tournamatic Tournapull, GM 6-71 diesel engine, fair condition.

1—Euclid Model S12 powered by GM 6-71 diesel engine.

1—Allis Chalmers Model HD 10 tractor with 4-71 diesel engine and double drum power control.

1—Caterpillar Model D6 tractor bare.

1—Hyster dragline attachment complete for D7.

2—Thrun Model 60 Oil-O-Matic Vibrating Compaction rollers.

1—Caterpillar Model D 13000 power unit.

1—Hercules DFXD diesel generator 48KW.

1—Barber-Greene Model 879 Asphalt Paver.

1—Osgood dragline mounted on Surplus truck.

1—Fruehauf 25 ton tandem low boy on 8:25 tires, very good condition.

INTERSTATE EQUIPMENT CO.
P.O. Box 868
Statesville, North Carolina
Ph. TRiangle 3-9048

FOR SALE

125 Hp. Full Automatic Cleaver-Brooks Steam Boiler. Combination gas and No. 5 Oil Burner. Re-tubed 1959....$4,400.00

PETER BAKER & SON
Lake Bluff, Illinois
Phone - Empire 2-3663

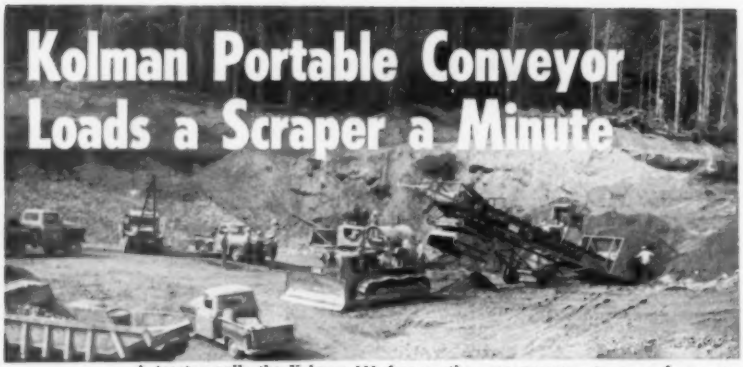
FOR SALE

8 Caterpillar D8's. (Serials 1H and 2U). All rails, sprockets, idlers and rollers in very good condition. Engines checked. Repainted and new decals. Some have double power control units, others with push blocks.

1 HD-5, with Loader, Excellent condition.
1 Case Tractor (rubber), w/loader & backhoe.
1 Lima 34 Paymaster shovel with backhoe.
1 HD-6 with Tractomotive loader. Good cond.

BUTEYN EXCAVATING & GRADING
3402 Main Ave. - Tel. GLencourt 8-3721
SHEBOYGAN, WISCONSIN

Kolman Portable Conveyor Loads a Scraper a Minute



A tractor pulls the Kolman 101 free as the crew prepares to move from one pit to another. The unit is designed for ease of movement. Note how the single-deck screen folds under for transporation.

Model 101 Speeds Movement of Borrow for Railroad Relocation in Washington Dam Project

Rigid sanitary, turbidity and time requirements did not prevent contractors from completing work on schedule for the relocating of 14 miles of Northern Pacific main line in preliminary work on the Howard A. Hanson Dam flood-control project on the Green River in western Washington.

Part of the credit goes to the hard-working Kolman Model 101 Conveyor-Screen plant. The Kolman conveyor was operated in a series of pits moving large quantities of borrow.

In the pits, as many as five Cat DS dozers brought material to a slot where a D9 with a U-dozer fed the conveyor dozer trap. A fleet of rubber-tired scrapers, which were loaded at a rate of one per minute, hauled the material to the big fills, some as high as 110 feet.

In a later stage, the conveyor was fitted with a 10-inch grizzly and a 9'x54" vibrating screen with 3"-square openings to produce subballast for the track.

Kolman offers a choice of single, double or triple-deck screens up to 5'x12' on the Model 101. Belt widths of 18" to 48" in lengths up to 60 feet.

Write for Literature and Prices

KOLMAN MANUFACTURING CO.

5200 West 12th St. Sioux Falls, S. D.

GRADERS-GRADERS-

40 ON HAND

DW21's, LW C PULLS

Other Good Used Equipment
All Priced Right to Sell

CAT 12 9K9739 Painted, Recapped Tires.
CAT 12 9K4483 Painted, Recapped Tires.
CAT 12 9K10968 Painted, Recapped Tires.
CAT 12 7T2686 Painted, Recapped Tires.
CAT 12 7T2101 Painted, Recapped Tires.
CAT 212 1M171 Single Axle, Good Tires.
CAT 212 9T656 50% Rubber
ADAMS 550 5919 Painted, Recapped Tires.
ADAMS 550 5391 Painted, Recapped Tires.
ADAMS 550 1159 Painted, Recapped Tires.
ADAMS 550 1132 Painted, Recapped Tires.
ADAMS 550 565 Painted, Recapped Tires.
ADAMS 550 370 Painted, 40% Rubber.
ADAMS 610 2850 Recapped Tires.
ADAMS 610 2166 75% Rubber - Painted.
ADAMS 610 1674 A-1 Condition w/Bros. Rotary Snow Plow, 60% Rubber.
ADAMS 610 1575 Painted, Recapped Tires.
ADAMS 610 1068 Painted, Recapped Tires.
AC-45 698 Recapped Tires, Good Cond.
GAL 104 MD14418 Recap Tires, Good Cond.
GAL 104 MD17057 40% Rubber, Good Cond.
GAL 102 MD8979 40% Rubber.
AW 99H H2594 Recapped Tires, A-1 Condition.

MOTOR SCRAPERS

11 LW C Tournapulls, Late Models A-1 cond.
CAT DW21 8W 1625, Rubber 75%.
CAT DW21 8W 1633, Rubber 50% front, 80% Rear.

TRACTORS

TD18A 181-35718 W/B.E. Dozer, DDPCU, Eng. Reconditioned. 75% tracks and rollers.
TD18A TDR 10405-T7BJ W/B.E. Angle Dozer, 50% Tracks.
TD18A 26598 w/Double Drum Unit, Push Plate, Tracks Reworked.

Vivian Equipment Co., Inc.
AMES, IOWA - CEdar 2-4133
Night & Sunday Phone Warren Loder
Jewell, Iowa - 827-5912

NEW BUCKETS

TERRIFIC BUYS ON DRAGLINES
SAVE 50 to 70%

ESCO NEW and COMPLETE TYPE STANDARD
2 YD. CAPACITY 5,300# approx. wt.
price **$1,250**

ERIE NEW & COMPLETE MODEL AX
1¾ yd. capacity, 3,850# approx. wt.
price.... **$1,150**

recommend for 1½ yd. machine
see at Udelson, Cleveland, Ohio
call or write either

SAM WINER MOTORS, INC.
3417 E. Waterloo Rd.
Akron 12, Ohio
Phone: MAyfair 8-2641

or

UDELSON EQUIP'T. CO.
3210 Woodland Ave.
Cleveland 15, Ohio
Phone: SU 1-1666

DRAVO-DOYLE
OFFERS FOR SALE OR RENTAL
THIS EQUIPMENT
FOR PAVING JOBS

Paving Forms (including stakes)
Curb or Curb and Gutter Forms
Concrete Finishers, Spreaders and Subgraders
Form Graders
Aggregate Batching Plants
Cement Batching Plants
P150 Base Pavers
Model 95 Road Wideners

Write or Call Now!

DRAVO-DOYLE COMPANY
2601 Preble Ave., Pittsburgh 33, Pa.
Phone: FAirfax 2-4500

BARGAINS

TANDEM ROLLER

1—New 3 to 5 ton Ferguson portable, Serial #493, with towing attachment including rubber tired wheels with automatic hydraulic jack for raising.

CRAWLER TRACTOR

1—Used Terratrac Model 600 diesel, Serial #338, with Terraloader and accessories.

Ensminger & Co., Inc.
57 Wood Street
Wilkes-Barre, Pa.
Phone: VAlley 4-3581

HEAVY EXCAVATION EQUIPMENT
LARGE DRAGLINES, SHOVELS, CRANES, ROTARY DRILLS, EUCLID DUMP TRUCKS
FRANK SWABB EQUIPMENT COMPANY, INC.
Hazleton National Bank Building, Hazleton Pa.
Phone GL 5-3658

"BRUSH-UP" on BRUSHES
at DALLAS BRUSH!

Call" Mr. Van" — The Friendly Brush Man for NEW Specifications and New Low Prices.

Rotary Sweeper Broom Cores
Road Drag Leveler Brooms
Street Push Brooms

Brushes for Every Industrial Need

DALLAS BRUSH MANUFACTURING CO.
5108 Westmoreland FL 7-6581
N. S. VanDeventer, Owner

FOR SALE
Erect Cranes - Draglines
Shovels - Backhoes

LATE MODELS—EXCELLENT CONDITION
Manitowoc 2000B, 3000B, 3500, 3900 and 4500.
Northwest 25, 6, 80D and 95 Models.
Bucyrus-Erie 22-B, 38-B, 51-B, 54-B.
Marion, Koehring, Link-Belt, Lorain, Lima and P&H long booms, wide long crawlers, diesel powered. In equivalent sizes available.

James C. French
SPECIALIZING ON:
Cranes - Drag - Clams - Shovels - Backhoes
P. O. Box 188 - 226 Berry Pkwy.
Park Ridge, Illinois TAlcott 3-4927

PAVING EQUIPMENT

You will find listed below the equipment contained in a complete paving spread. These machines are all in excellent condition and ready to go to work. We are disposing of this equipment due to the press of business in related fields of construction. All of this equipment meets state highway specifications.

1—69 cu. yd. 2-compartment end sand bin, cantilever platform, columns 16'7", truck clearance 8'6". Wt. 15,910#.
1—34E. automatic type "J" dual stone and sand batcher with over-under weight lights. Wt. 4,500#.
1—37 yd. 11' dia. cement bin, cantilever, detachable columns 14'2", truck clearance 8'6". Wt. 9,174#.
1—Bin signal with adjustable support. Wt. 36#.
2—34 E. automatic interlocked cement batchers with two 8x15 electric air operated filling valves, two 8x15 automatic vane feeders, two 2 H.P. single speed Gearhead Unibrake motors (110 Volt) electrical controls. Wt. 5,500#.
2—Electric vibrators 110 Volt. Wt. 34#.
1—#44 cement elevator by 37' c/c 10" undertrack screw by 20'9" c/c. 10 H.P. drive and guard, parting detail (last 10' of screw removable.) Wt. 11,496#.
2/3 Set quick air connections for 2 bins and electrical connections and wiring for two bins.

THE ABOVE LISTED EQUIPMENT COMBINES TO MAKE ONE COMPLETE BUTLER BATCH PLANT FOR PAVING OUTFIT.

1—Quincy Electric Air Compressor.
1—Schramm Electric Air Compressor.
1—Rex 34E Double Drum Paver with Diesel motor, ad-air attachment, automatic controls, S/N GD305.
1—Heltzel Finishing Machine S/N 56x128 18' to 26'.
1—Jackson Vibrator and Paving Tube S/N 83200 Model PT-202A.
1—Heltzel Mechanical Belting Machine S/N 56x137 18' to 26'.
1—Heltzel Bridge 18' to 26'.
2—Cleveland Form Tampers S/N 306x56
S/N 320x56LB
1—Joint Applicator S/N 459 Model RJ-P.
1—Tar Kettle S/N 45-S366 Model AS-120.
6000' 10x10 paving forms.
1—Cement Car Vibrator.
2—Heltzel subgraders (tail blades) Adj. from 20 to 25 ft.
1—Cleveland subgrade scraper S/N 52x65.
1—Cleveland Form Grader S/N 235x56.
1—Tar kettle S/N 45-3368. Model AS-120.

ALL OF THE ABOVE EQUIPMENT WAS PURCHASED NEW IN 1956 AND HAS HAD VERY LITTLE USE. DURING 1958 IT POURED APPROXIMATELY 18,000 FEET OF FULL WIDTH SLAB AND WAS NOT USED DURING 1959.

1—Koehring Longitudinal Finisher, 20 to 24 foot widths with transportation wheels having four 6:00 x 16 Pneumatic tires and towing bar. Rubber wheels for one side.
1—Jaeger Concrete Spreader finisher. Model CSS20-25. S/N 57876, with Quick Crown Change Screed with one complete set of extensions, set for 24' width, 25/32" crown Incl. 4 part #30083-2 single flanged and 2 part x3009-2 cone tread traction wheels installed with little lugs. Rubber wheels one side.

THE ABOVE EQUIPMENT HAS POURED APPROXIMATELY 18,000 FEET OF FULL WIDTH SLAB SINCE PURCHASED NEW IN 1958.

1—CMC 6 cu. yd. Transcrete Mixer S/N 106832.
1—Blaw Knox 3 cu. yd. mixer S/N 48-H3-287.
1—Butler Batch Plant.
Complete Step Plant with one cement Elevator—Ideal for Ready Mix Plant—Fully automatic to meet highway specifications.
1—Track Plant for unloading bulk cement into trucks. Complete with cement screw.
1—Universal 10x24 & AW crusher. Roller Bearings S/N 110x50.
1—Adams 610 Motor Grader S/N 2523.
1—Caterpillar #12 Motor Grader S/N 8T2156.

THIS EQUIPMENT IS IN EXCELLENT CONDITION.

LARSON CONSTRUCTION COMPANY

P. O. Box 368
Cedar Falls, Iowa

FOR SALE

(4) Euclid 6 wheeler 14TDT rubber tired 15.5 cu. yd. scrapers.
(5) Rebuilt TS-24 Euclid twin engine rubber tired scrapers.
(1) Mod. TC-12 Euclid crawler tractor with dozer, used 5 months, rebuilt.
(1) Mod. TC-12 Euclid twin engine crawler tractor with pushblade, rebuilt.
(2) Used TS-360 Allis-Chalmers, 15 cu. yd. Scrapers, good condition, tires good.
(2) Used TS-300 Allis-Chalmers rubber-tired Scrapers, 14 yd. struck capacity. Good condition. 1955 machines.
(1) Used Model 25 Northwest Crane, S/N 18824 (1956). Powered by Murphy Diesel engine, fairlead, tagline, long crawlers, 28" shoes, excellent condition.
(5) Used T35 Shield Bantam Truck, Cranes and Backhoes.
(1) Used Huber Warco Maintainer.
(1) Used Model 88 Parsons Pneumatic Tired Trenching Machine.

GIL BOERS EQUIPMENT COMPANY

7625 So. Kedzie Avenue, Chicago 52, Illinois — Prospect 6-4000

GOLD COAST

SPECIALS

2 - INTERNATIONAL TD-6's, Hydr. Angledozers, each $1,850
INTERNATIONAL TD-9, Hydr. Angledozer, excellent condition .. $2,450
INTERNATIONAL TD-9, Tractor, rebuilt motor ..... $ 950
P & H ½ Yd. Motor Crane on Ford tandem Truck, 30 ft. Boom, clean, runs good $1,900

GOLD COAST EQUIPMENT CO., INC.
2997 N. W. No. River Dr. • NE 4-1655
MIAMI, FLORIDA

WANTED:

ASPHALT PLANT

Late Model 2-3 ton Pug Mill Plant

Delivery to Indiana in April

Reply: Box 1237
ROADS AND STREETS
22 W. Maple Street
Chicago 10, Illinois

"CITATION"

For Quick—Fast Steam Cleaning

A heavy duty portable steam cleaner designed with the user in mind. All moving parts mounted in sealed ball bearings for rugged dependability and long life. Fully automatic, delivers a high volume of wet saturated steam at any pressure from 60 to 120 lbs., to cover any application. Mounted on large rubber tired wheels, and comes complete with 25 ft. steam hose and steam gun.

- Mark VII model converts 75 gal. of water per hr.
- Guaranteed one full year
- Mark VIII model converts 120 gal. of water per hr.

For more detailed information call or write

A & M Mfg. Co., Inc.
BOX 307 — STate 7-2981
GRAVETTE, ARKANSAS
DEALER INQUIRIES INVITED

FOR SALE

1960—TD24 Ripper Model GR Backhoe Attachment 40′ Crane Boom
1957—Model T35A Schield Bantam Excavator
1954—Model 210 Ingersoll Rand Compressor
1953—Owen Bucket, ½ yd.
1953—Omaha ¾ yd. Dragline Bucket
1959—International Tractor
1957—Guttersnipe Sweeper
1954—Trojan Loadster
1956—Trojan Loadster (2)
1953—Trojan Loadster
1958—Model 2460 Gradall
1958—TD-18 Int. Crawler Tractor
1958—American Model 795C Crawler
1959—Galion Tandem Grader
1959—Buffalo Springfield Roller
1958—D8 Caterpillar Tractor
1958—Model 750C American Shovel
1959—International Tractor
1953—Ingersoll Rand Compressor
1953—International Crawler Tractor
1953—International Angledozer
1955—McKiernan Terry Pilehammer
1953—American Model 375 Crawler
1959—International Tractor, TD-24
1959—Vibro Tamper
1955—Drive Welder
1959—T75 International Scrapers (4)
1956—F800 Ford Dump Truck
1958—Mack Trucks (2)
1959—Mack Truck
1958—Ford Dump Truck
1954—Ford Dump Truck
1959—Ford Tank Truck

WHITING CONSTRUCTION CORP.
54 Quincy Avenue
Dedham, Massachusetts
Ph. DA 6-3398

LATE MODEL EUCLID SCRAPERS AND CRAWLERS

4—EUCLID, 1958 Model TS-24 TWIN POWER SCRAPERS, 24 C.Y. struck capacity, 33.5x33 tires almost new, with General Motors Engines recently rebuilt.

EUCLID TC-12 TWIN POWER CRAWLER TRACTORS, 1956 to 1959 Models, all in top operating condition, with tracks from 50 percent to brand new. Available with C-Frame pushers and P.C.U., or fixed push plates. All engines low time or recently overhauled.

4—EUCLID - 1955 Model S-18 SCRAPERS, 21 c.y. struck capacity, new 27.00x33 drive tires. Allison power shift transmission, rebuilt 1958. General Motors 6-110 engines.

EUCLID Model S-12 SCRAPERS, 12 c.y. struck capacity, stick shift, good 26.5x25 tires. Recently overhauled. General Motors 6-71 diesel power.

EUCLID, 1958, Model S-7 SCRAPER, 7 cu. yd. struck capacity, stick shift, 21.00x25 tires. General Motors diesel power, in top condition.

ADAMS MACHINERY, INC.
2016 West Cornell Street
MILWAUKEE 9, WISCONSIN
PHONE: HIlltop 4-7400
EAU CLAIRE—TEmple 2-2895
GREEN BAY—HEmlock 7-8791

FOR SALE

USED EQUIPMENT AS LISTED, ALL IN GOOD TO VERY GOOD CONDITION; PRICED TO SELL:

120 yd. Johnson semi-automatic concrete batch plant; five compartments (one cement) bulk cement under track truck loader—100 bbl. bulk cement tank trailer—35,000 sq. ft. Atlas (Irvington) steel speed forms; and 3,000 sq. ft. Economy steel forms for concrete walls—L-4 Lorain crawler crane, 1948, SN 18554—Northwest 95 crawler crane, SN 12527—P & H crawler crane, model 855 L.C. diesel, SN 10572, 1946—P & H crawler crane 855-D, SN 10984 (Lorain and P & H cranes have shovel front and backhoe attachments)—Kwik-Steam generator, Littleford model 3600 G-3 TD-24 bulldozers, SN 1914, 2024, 4266—2 Chester 5′ diam. dual tandem sheepsfoot rollers—Foote 34E paver, SN 49211—Multi-Foots 34E paver, SN 48020—10 ton, 3 wheel Huber roller, SN 10821—Rome Disc plowing harrow, model TMR 24-30—2 more trench well-point pumps complete with 600′ pipe main.

PHONE: GR. 6-4103
Write P.O. Box 402, Barre, Vermont

FOR SALE

DRYER BURNERS
Hopkins Bros. 400 Gal/Hr. #5 Fuel Oil Burner and Maxon combination Oil-Gas Burner—500 Gal/Hr capacity. Both in excellent condition.

HOT OIL HEATER
HyWay Heater Model 35C.

ROLLERS
Buffalo-Springfield 10-12½ Ton 3-wheel Roller & Bros Rubber Tired Roller Model SP-54.

ASPHALT SPREADER
Barber-Greene Model 879-A.

MISC. EQUIPMENT
Braden Winch; 1948 Ford 4w dump truck; 1949 Ford Tank Truck; 94 HP Donovan Boiler.

The above equipment is available for inspection at our yard.

GALLAGHER ASPHALT CORPORATION
Thornton, Illinois
IN 8-5010 (Chgo)
TRojan 7-7160

The following equipment is FOR SALE at our yard and subject to prior sale.

Southern Engineering & Construction Corp.
P. O. Box 484, Richmond, Virginia.
Telephone EL 8-0751

1—#12 Cat Motorgrader (new condition)
1—New Hough HU Payloader w/ Drott bucket
1—Shield Bantam Truck Crane 5T-30′ w/ backhoe
1—#44 Barber-Greene Ditcher 18″ x 7′ (new condition)
1—50 H.P. 2 Drum O.K. Hoist
7—Mod. N50 Getman Scootcretes
8—Mod. 1200 Silent Glo Heaters
1—D8 Cat Tractor w/ Cat 25 power unit
1—12cy LeTourneau Pan LP
1—Winslow Bin-Batch
1—105 I.R. Compressor

7500 sf New Type Universal Forms w/ accessories

CATERPILLAR:
6—D8's, 2U Series with stick, Cat 8S dozer & 25 unit, excel.
1—D7, 3T Series, 7S dozer & 2S unit, very good.
1—D6, 8U Series, 6S hyd dozer, real bargain — $5900.
1—D8, 2U Series with slide bar, 8S dozer and 25 unit, hyd. booster steering.

INTERNATIONAL:
1—TD24 with push plate, 7 roller track frame.
1—TD-18A with B.E. hyd straight dozer, tractor rebuilt and new rails.
1—TD14A with B.E. hyd-straight dozer, very sharp.
1—W450-D wheel tractor with FE loader. Only 400 hours.

ALLIS-CHALMERS:
1—HD14A with Gar Wood unit and cable dozer.
1—TS200 Motor Scraper, completely rebuilt throughout.

MISCELLANEOUS:
1—LeT Super "C" Tournapull.
1—LeT "FP" Scraper.
1—Case 420B wheel tractor, FE loader with torque conv., near new.
1—John Deere 440 Diesel crawler with 831 loader, '59 model.
1—A.W. model 99M grader, a ready-to-go work horse, cheap.
1—Jaeger air compr., 250 CFM, on trailer, looks and runs like new, less than half of new price.
1—1952 Unit Dragline 1020, GMC 371 engine, new bucket, good undercarriage.

LAKE CRYSTAL CONSTRUCTION MACHINERY CO.
Lake Crystal, Minnesota
Tel. RAndolph 6-3316
After Hours RAndolph 6-4519

AN AUCTION—CONSTRUCTION EQUIPMENT

WEDNESDAY, MAY 10, 10:00 A.M. CHEYENNE, WYOMING

LOCATION **The sale site is located 5 miles East of Cheyenne on Old Highway 30 (At Archer, Wyoming). This is ½ mile West of New Highway 30. Cheyenne is well served by all modes of transportation, and good accommodations are available.**

NOTICE: **The Platte Valley Construction Co. partnership is being dissolved. Most of this equipment is late model, and has all been highly maintained by the Platte Valley Construction Co.**

EACH PIECE POSITIVELY SELLS TO THE HIGHEST BIDDER, NO BID-INS, NO BUY-BACKS, NO MINIMUM PRICES!!

MOTOR SCRAPERS-PULL SCRAPERS: (5) Cat DW-21 Mtr Scrapers, 69C series, all purchased new by Platte Valley Const Co, good; Cat DW-21 Engine, 69C, good; (3) LeT W scrapers, good; (2) LeT W Scrapers w/sheaves for tandem hook-up, good.
TRACTORS-LOADERS: Cat D-9, 18A w/'C' Frame & Push Block, #30 CCU, good; Cat D-9, 18A, w/'C' Frame, Push Block; #30 CCU & Cat hyd Ripper, good; Cat D-8, H series, 36A, w/dozer, good; Cat D-8, 14A w/#29 CCU rear mtd. & front mtd #25 CCU, good; Cat D-8, 14A w/dozer, #30 CCU, #8 hyd rear ripper, good; Cat D-8, 14A w/push block, good; Cat D-8, 14A w/dozer, #29 CCU, good; Cat D-7, 17A w/dozer, #24 front CCU, Hyster Hystaway Crane w/30' boom, good; Cat d-6, 9U w/Hyster Hystaway Crane w/25' boom, good; (2) Cat D-4's w/hyd dozers, good; A-C HD-9G Loader, good; 2½ yd Rock Bkt for HD-9G; Ford NA Wheel Tractor w/loader, dozer & backhoe, good; Scoopmobile, good.
MOTOR GRADERS-ROLLERS: Cat No. 12 Grader, 70D, very good; (2) Cat No. 12 Graders, 8T's, good; Adams 610 & 550 Graders, good; (2) Essick VR-54 vibrating Rollers; (2) American 50-ton Compactors; (3) 60" DD Sheepfoot Rollers; other Sheepfoot Rollers; 13-wheel Pneu Roller.
DRAGLINES-ATTACHMENTS: Northwest 25 Dragline, w/50' boom, good; Lorain L-41 Dragline, w/60' boom, good; Dragline, Clamshell, Concrete Buckets & Northwest 80D Shovel Attachment.
TRUCKS-TRAILERS: (2) '55 Ford T800 Tandem Truck Tractors; '54 Mack, '52 Diamond T, '48 Mack, '47 Dodge & '46 White Truck Tractors; '56 Ford T700 Tandem Dump Truck; '53 Chev & '52 Ford Flat Bed Trucks; '50 Ford & Chev Dump Trucks; (2) Chev Flat Dump Bed Trucks; '53 & (2) '46 IHC Tandem Tank Trucks; (6) Pickups; American 30' Oil Field Float; (6) Tandem Vans; (6) Tandem Tank Trailers.
CONCRETE EQUIPMENT-PUMPS-LIGHT PLANTS-MISCELLANEOUS: (2) Winslow 45-ton 2G3 compartment Bin-A-Batchers; (2) CIMCO portable Twin-Batch-Bins; Jaeger & Koehring 16S and Jaeger 11S Mixers; (4) Concrete Vibrators; LeRoy & I-R 105 Compressors & LeRoy 105 Tractair; (13) Diaphragm & Centrifugal Pumps, to 4"; (9) Kohler Light Plants, to 10KW; 3C' Bucket Loader; Pull type Ripper; Cherry Picker; D-8, 14A 'C' Frame & Push Cup; Steam Boiler; Welders to 300 amp; Table & Chain Saws; Water & Fuel tanks to 30,000 gal; Shop Equipment, and many, many other small items. WRITE-WIRE-CALL Auctioneers for complete listing!!!

EACH PIECE POSITIVELY SELLS TO THE HIGHEST BIDDER, WITHOUT LIMIT, MINIMUM OR RESERVATION!!!

TERMS: **ON THE SPOT FINANCING . . . ⅓ down payment terms available to all contractors (Users) on major items totaling over $2,000 (excluding trucks and trailers), or . . . Complete Payment Sale Day! If payment is to be made by Personal or Company checks you must have a letter from your banker. Certified or Cashier's checks accepted! Immediate possession of all equipment upon proper settlement.**

FORKE BROTHERS
the Auctioneers
321 Sharp Bldg. **Lincoln, Nebraska** HIlmlock 2-1045
— EQUIPMENT AUCTION LEADERSHIP SINCE 1921 —

PLATTE VALLEY CONSTRUCTION CO. - Owner
Home Office—
Grand Island, Nebr.

GMC TRUCKS

1—'56 FWD diesel tandems with 210-hp GM motors, 10 spd, R Ranger. Priced from $3900 to $5200.
2—'55 GMC DFW822 tandem diesels with 10 spd, R Ranger, Reconditioned.
1—'56 International RF195 tandem, 450 motor, 5 spd trans, air, 900 tires.
1—'55 Ford T-800 tandem, 3 spd aux, 900 tires. Fair cond.
1—'50 Henrickson tandem, 450 motor, 2 spd aux., with air, 10:00 tires.
2—'56 GMC MW503 tandems, 8 yd dumps with 3 spd aux. Reconditioned. A-1.
65 other gas and diesel tractors. All makes and sizes.

Priced to sell now

McGEE TRUCKS, INC.
2535 University Ave., St. Paul, Minn.
Phone Midway 6-7555

SAVES 60%

OF THE COST OF MEASURING DISTANCES

MAINCO DISTANCE MEASURING WHEEL

ONE MAN and a MAINCO WHEEL does it better, faster than 2 men using chain or tape

Send for descriptive folder
THE MAINTENANCE CO., INC. Dept. D
10-40 45th Ave., Long Island City 1, N. Y.

FOR SALE

Five—Caterpillar Scrapers Model 9D
Serial No. 9V-5122 Thru 9V-5126.
All Scrapers have built-up sideboards.
Excellent condition.

Each $7,500

TERMS: ⅓ DOWN AND UP TO 24 MONTHS TO PAY AT 6% INTEREST

Parts Suppliers of Miami, Inc.
TU 7-1032, TU 7-4162
509 W. 27th St., HIALEAH, FLA.

FOR SALE

DRAGLINES · SHOVELS · CRANES
All Makes and Models,
½ yd. to 35 yd.

EUCLIDS:
Rear, Bottom Dumps and Scrapers

"Other equipment available not listed above"

WILLIAM LUBRECHT, III
Construction Equipment
311 W. Diamond Avenue Hazleton, Pa.
Gladstone 5-4041 5-0253

STEEL SHEET PILING

LARSSEN and ROMBAS Sections

STOCKS AVAILABLE IN:
- Linden, New Jersey
- Ft. Lauderdale, Florida
- Houston, Texas

WESTERN SERVICES CORPORATION
601 E. Linden Ave., Linden, N. J.
MArket 4-4000 HUnter 6-4000
In Florida Call: Port Everglade Steel Co. Ft. Lauderdale—JA. 4-0545
In Houston Call: G. Oliver—CA. 4-7234

ATTACHMENTS AVAILABLE

Northwest - Bucyrus-Erie - Lima - Marion - Link-Belt - Lorain - P&H - Manitowoc - Shovel - Backhoe - Clam Drag - All sizes.

JAMES C. FRENCH
226 Berry Pkwy. - TAlcott 3-4927
P. O. Box 188 - Park Ridge, Illinois

WANTED TO BUY

Hot Oil Heater

Highway Hopkins Childers or Bros.

BAR-COAT BLACK TOP CO.
P. O. Box 475 Mosinee, Wisconsin

CALL UPON *MUTUAL* FOR THE NATION'S LARGEST

PARTS STOCK

Headquarters All Heavy-duty Equipment, Supplies & Parts

• DUMP TRUCKS • LOADERS • CRANES • ENGINES

Lowest Prices - Complete Satisfaction Guaranteed

NEW and Guaranteed REBUILT ENGINES

Completely Dynamometer "Run-In" and Tested in our own modern extensive rebuilding shops.

• HERCULES • CUMMINS
• CONTINENTAL • WAUKESHA
• GMC DIESEL

25TH YEAR OF QUALITY SERVICE TO THE HEAVY EQUIPMENT INDUSTRY!

MUTUAL TRUCK PARTS Co., Inc.

2000 S. WABASH AVENUE
CHICAGO 16, ILLINOIS

Telephone: CAlumet 5-3500

FOR SALE

ATTACHMENTS

1—34 Lima Backhoe
1—34 Lima Shovel
1—44 Lima Shovel
1—604 Lima Shovel
1—304 Koehring Backhoe — Like New.

GRADERS

1—"D" Allis-Chalmers
1—312 Adams, Cab Lights, Heater, 12' Moldboard.
1—99H Austin-Western

PAVERS

1—P150 Blaw Knox Base Paver, Excellent Condition.
2—PF90 Blaw Knox Pavers.
2—879A Barber-Greene Pavers.
2—Adnun Pavers.
1—27E Foote Paver.

SCRAPERS

3—S-7 Euclids, Standard and Automatic Transmissions, Sideboards.
2—TS200 Allis-Chalmers, Very Good Condition.
4—S-18 Euclids, Three have new, never used Tractors.

TRACTORS

1—HD16 Allis-Chalmers, Hydraulic Dozer, Excellent Condition.
1—TD24 International Dozer, Double Drum Rear Control Unit.
1—TD14 International Hydraulic Dozer, Good Condition.
1—TD9 International Hydraulic Dozer, Needs Final Drive Repair.
1—TD6 International Hydraulic Dozer, Angle Blade.
1—300 International, Rubber Tired Tractor, Backhoe and Backfiller.
1—350 International Rubber Tired Tractor, Backhoe and Loader.

REID-HOLCOMB CO., INC.
1815 Kentucky Ave.
Indianapolis, Indiana
Ph. MElrose 2-4433

For Sale

Complete Crushing Spread

Consisting of:

30' x 42" Pioneer feeder.
32 x 40 Cedarapids jaw crusher.
30 x 42 Cedarapids Impactor secondary w/5' x 14' 3-deck screen.
Northwest 80-D Shovel ser. no. 20548.
Cat. D7 dozer ser. no. 17A-14586.
3 Mack Model LRX quarry trucks.
G-D 600 c.f.m. air comp.
G-D Air Trac drill.
G-D Air motor.
Damco Blastholer rotary drill.

Location near Huntsville, Texas

MILLER C. BEASLEY MACHINERY CO.
2237 W. Northwest Hwy.
¾ Mi. W. of Circle on Grapevine Hwy.
P. O. Box 6995
Phone: FI 7-8325
Night: RI 2-6101
Dallas, Texas

BAY CITY SHOVEL PARTS

FROM 30 TO 70% OFF

11-B4468	Hoist Brake Bands
8-B2683	E.Z. Control Bands
1-B6364	E.Z. Control Bands
1-B841	Clutch Bands
6-B3950	Clutch Bands
15-B4572	Linings
4-B3875	Linings
24-B3660	Bushings
41-B3663	Bushings
66-B5325	Bushings
M-566 B1302	Bushings
4-B848	Shafts
2-B1066	Shafts
3-B1358	Shafts
4-B1647	Shafts
S-4	Motor Clutch Sleeve
1-B5341	Shafts
8-B5336	Shafts
14-B5351	Shafts
15-B5032	Shafts
H-1606 B848	Rollers
H-1708 B1066	Rollers
H-2682 B5330	Rollers
H-75 B2469	Sheaves
H-1577A B1930	Clutch Carriers
H-2104 B1573	Tooth Base
H-2712 B5559	Tooth Base
H-2980 B6485	Laggings
H-2981 B6486	Laggings
H-1520A B919	Shifters
586	51 Links Drive Chain

We Have Other Parts For Bay Citys 25, 30, 45, 65.

VETERAN'S EXCAVATING COMPANY, INC.
1157 N. Ballenger - Flint 4, Mich.
Phones: CE 5-0121 — CE 5-5298

TRUCKS WANTED

Highest dollar value paid for new and used trucks and all kinds of used equipment. All types of truck equipment bought and sold, including war surplus. Write, phone or wire:

BILL FISHEL
Vandeventer Auto Sales
717 So. Vandeventer St. Louis 10, Mo.
Ph. FRanklin 1-1750

STOCK REDUCTION SALE

LORAIN Truck Crane, 20 Ton, on 4x6 Factory Carrier, 65' Boom plus Jib...$8,500
SCHIELD-BANTAM Truck Crane on 6x6 Factory Carrier, 40' Boom, top condition $4,750
LITTLE GIANT Truck Crane, ⅜ Yd., 30' Boom, on GM 6x6 ....$1,800
QUICKWAY Truck Crane, 30' Boom, on GM 6x6 ....$2,000
2—ALLIS-CHALMERS HD-14's with Baker hydr. angle Blade, extra clean, each. $4,500
CATERPILLAR D6, wide Track with hydr. Track Adjusters and Logging Winch $3,000
(Also CAT D2's and D4's)
ADAMS Model 312 Grader $1,750
GM 6-71 Diesel Power Plant, 60 KW, New Condition $3,750
2—ROSS Forklifts, 14000 lb. cap. pneumatic tires, 15' lift, each $2,500
2—CLARK Forklifts, 6,000 lb. cap., solid tires each $1,400
3—HUBER Maintainers with grader and dozer blades, each $1,000
11—JET ENGINES, J46, factory rebuilt, zero hours. Use for frost control, or on boats, barges. Burn 65 GPH fuel oil @ 4000 RPM. Each ....$ 750

WAREHOUSE
Sales & Salvage Co.
5290 N.W. 27th Ave. • NEwton 4-2754
MIAMI, FLORIDA

SPECIAL - JUST RECEIVED

GRADER TIRES

NEW - FACTORY FRESH
NYLON - FIRST LINE

1300 x 24, 8 Ply $119.00
1400 x 24, 12 Ply 129.00

OTHER TIRES

1400 x 20, 16 ply, Rocklug, unused	$125.00
1400 x 20, 12 ply, Military, Good, Used	$65.00
1350 x 20, 12 ply, Conventional, unused	$65.00
1100 x 20, 14 ply, Military, Unused	$60.00
Inc. Tube and flap - with 10 hole Budd Wheel	$72.50
900 x 16, 8 ply, Conventional, 95%	$32.50
1000 x 15, 14 ply, Conventional, 95%	$50.00
1300 x 24, 8 ply, Grader, Good, Used	$45.00
1400 x 24, 16 ply, Conventional, Unused Takeoffs	$95.00
1800 x 24, 16 ply, low profile Good, Used	$100.00
1600 x 25, 12 ply, Low profile, Unused	$85.00
1600 x 25, 20 ply, Military, Good, Used	$85.00
32 x 8.8 (Fits 750 x 15) 18 ply, Nylon, Unused	$37.50
32 x 8.8 Tubes, Unused	$3.50
900 x 16 Tubes, Unused	$4.00

SAM WINER MOTORS, INC.
3417 E. Waterloo Road - Akron 12, Ohio
MA 8-2641

LORAIN CROWD CHAIN

Jeffroy 234P Links —
3½ In. Pitch
Will Fit Crowd on Models
85-820-82-80-79-77
THIS IS NEW CHAIN

PRICE - $7.50 Per Ft.

Minimum Order 10 Ft. - All Shipments Made in Multiples of 10 Ft. - Packed 10 Ft. And 30 Ft. To The Box. Price F.O.B. Braddock, Pennsylvania.

WRECKING BALLS

3 Ton Pear Shaped - New Army Surplus

PRICE: $350

F.O.B. BRADDOCK, PA.

100 TON SAND AND GRAVEL BIN

2 Compartment with bucket elevating loader. Will be dismantled, marked and loaded on your truck. EXCELLENT CONDITION.

LOADER CONVEYORS

PETTIBONE-MULLIKEN force feed loader, Model No. 77PC. Hercules Diesel Engine, Manufactured 1953. Excellent Condition.

HEISS LOADER

Model No. 75CC, 4 cylinder air cooled engine. REASONABLE.

FOR SALE LANDING MATS

Pierced Steel Type
10' x 15"
EXCELLENT CONDITION
In bundles of 15 each
Perfect for roadways, ramps, parking lots, trailer camps, truck sides, bins, etc.

$75.00 N.T.

F.O.B. Chambersburg, Penna.
Good Condition
In trailer-load quantities.
Will consider offer on entire lot.

JOSH STEEL COMPANY
Sixth Street - Phone ELectric 1-3500, Braddock, Penna.

ASPHALT DISTRIBUTORS

All Etnyres; Full circulating bars; Tachometers, etc.; Newly overhauled in our own shop.

1,069 Gals. Truck Mounted
1,380 Gals. Truck Mounted
1,595 Gals. Semi-trailer

All in ready-to-operate condition.
Storage Tanks - Spreader Boxes
Insulated Boosters Semis
Aggregate Loaders

McELROY TRANSPORT CO.
P.O. Box 7432 Ph. TE 8-2211
Fort Worth, Texas

High Wages For Heavy Equipment Workers

Construction is BOOMING World Wide

TRAIN NOW QUICKLY AND EASILY FOR SECURITY AND TOP INCOME

WORK ON GIANT EARTHMOVING EQUIPMENT

Age limit 17 to 55. National will take care of the rest plus getting you ready for the contractors. Lots of contractors working overseas.

Skilled Operators Earn Higher Wages

Write or Call

NATIONAL SCHOOLS OF CONSTRUCTION, INC.
On Highway 40, 5½ miles west
P.O. BOX 237 GREENFIELD, INDIANA
Phone: MElrose 8-0378 (Indianapolis)

3—10'x78' Dryers—2'3'4'5½'7' Symons and Telsmith Cone Crushers—3648-4042-4872 Jaw Crushers and smaller sizes—48" Gyratory & 20" Gyratory Vibrating Feeders—other types of Feeders—Eagle Fine & Coarse Material Washers—Dixie Non Clog moving plate Hammermills—Asphalt Plants—Jaw—Cone—Gyratory—Roll Double and Triple—Hammermill and Impact Crushers—Ball—Rod—Tube Mills—Screening, Washing and Crushing Plants, Classifiers, Compressors, Conveyors, Cranes, Drills, Dump Cars, Dredges, Feeders, Hoists, Motors, Generators, Kilns, Dryers, Locomotives, Pumps, Screens, Shovels, Draglines, Transformers, Euclid Trucks.

STANLEY B. TROYER EQUIPMENT CO.
Box 97 Phone 500 Crosby, Minnesota

Ready to Work

Barber-Greene #840 Asphalt Plant. 40 tons per hour. Has cold hopper bin, two material cold feeders, feeder housing and bulkhead plate, cold elevator, #839 Dryer, Dual Cyclone dust collector, 16' hot elevator, fines feeder and screw conveyor #840 multiple aggregate mixer. Powered by two gasoline engines. Also, 25 H.P. steam boiler, transfer pump and piping. Must be seen to be appreciated.

WAINER BROTHERS, Inc.
Valdosta, Georgia CHerry 2-4011

CYLINDER HEADS Save 50 to 80%

GAS and Diesel . . . Have your Cylinder heads rebuilt. Preheated and gas welded, machine complete, ready to install. Factory guarantee. Exchange service on popular models.

Chapin Cylinder Head Co.
Since 1938 - PHONE NO. 472-6121
CHAPIN (Morgan County), ILLINOIS

PAINT

GRADERS - ROLLERS
TRACTORS - DRAGLINES

From Automotive Quality Paints Manufactured by DITZLER, DuPONT & R. M. PAINTS

INTERNATIONAL RED
CATERPILLAR YELLOW
OMAHA ORANGE

gloss enamel $1.90 per gal. 55 gal. drums

SPECIALS SPECIALS SPECIALS

Red Oxide Primer	$1.35	Black Frame Paint	$ .80
Black Gloss Enamel	1.50	Zinc Chromate Primer	2.15
John Deere Green	3.00	Meadow Green	2.50

Add 25c per gal. for 5 gal. cans - All Prices F.O.B. Detroit

USE OUR SPECIAL PHONE SERVICE — WA 5-6630 at no charge to you

MICHIGAN INDUSTRIAL FINISHES CORP.
9045 Vincent St. — Detroit 11, Michigan

FOR SALE OR RENT

D-9 CAT W/PUSH BLOCK—Excellent; Serial #19A342; Engine Rebuilt; Pins & Bushings Turned; Rails Excellent; New Style Turbo-Charger; Rollers Excellent; Sprockets Rebuilt; New Rebuilt Torque Converter; Starting Engine Rebuilt; Appearance Excellent; The Cleanest D9 We Have Seen. Price, FOB Columbia, S. C., **$25,000.**

D-8 CAT W/CAT DD PCU, Cable Angledozer; Ser. #2U15631; Rebuilt Engine; New Pins & Bushings; Rails Built Up; Excellent Rollers; New Sprockets; Completely Gone Over. Price, FOB Columbia, S. C., **$15,000.**
Rebuilt H O D Hough Payloader — Rebuilt 175 A Michigan Loader — Rebuilt 75 A Diesel Michigan Loader — Rebuilt Various Size Crawlers —

CAROLINA EQUIPMENT AND PARTS COMPANY
Post Office Box 1314
COLUMBIA, SOUTH CAROLINA
or call collect, AL 6-4969, Columbia.

DOZER BLADE

FOR AUSTIN WESTERN H99

NEW UNUSED BLADE

9' wide, 3'4" high, ⅜" thick. Can be adapted to your own needs of almost any tractor both wheel or crawler. Today's cost $1,200. **YOUR PRICE F.O.B. OUR YARD $177.50**

For more information or to place order, write or call

WARREN E. DEAN—GOVERNMENT SURPLUS

P.O. Box 241 • Rolla, Missouri
Phone EMerson 4-2624 or
EMerson 4-3114

AMPHIBIOUS VEHICLE

SELLING UNDER 5% OF ACQUISITION ($42,800)
May we have your requirements for other Machinery & Equipment

FOR Boat Owners • Fishermen • Exploration • Landscapers • Miners • Contractors • Loggers • Boat Clubs • Islanders • Marine Dealers • Marinas • Utilities • Oil Companies

MK4 (LVT (4)) Designed for Hauling and Towing Supplies and Equipment over rough terrain and water. Unused, like new. 250 H.P. Continental 7-cylinder radial air cooled engine..... ONLY $1795

SEND FOR DESCRIPTIVE BROCHURES

PORT TOLEDO STEEL CO.
310 Sylvania Dept. EA TOLEDO 12, OHIO GR. 9-5357

DRAGLINE MATS

Any Length, Width or
Built to Specifications
We build them a little better for a little less.
STRICTLY HARDWOOD.

Also LUMBER and PILING

Kent Piling Co., Inc.
CHARLES KENT, PRESIDENT
Phone Days: Amite 2641 - 2644 - Night 8454
FLUKER, LOUISIANA

We are a Nation-Wide business in
STEEL SHEET PILING

FOR SALE OR RENT

80 pcs.	48 ft.	Z-32	Missouri
213 pcs.	80 ft.	MP-116	Illinois
100 pcs.	550-60 ft.	MP-115	Tennessee
218 pcs.	50-60 ft.	DP-2	New York
682 pcs.	45 ft.	MP-101	Indiana
473 pcs.	30 ft.	AP-3	Maryland
160 pcs.	25 ft.	DP-2	Penna.
280 pcs.	20 ft.	MP-112	Kansas

Storage yards at Buffalo - Baltimore - New Orleans - Memphis - Chicago
Also - H Bearing Pile

McKiernan - Terry and Vulcan Pile Hammers and Extractors - Construction and Railroad Equipment.

We are as close as your telephone—you can obtain Steel Sheet PILING BY DIALING CHestnut 1-4474, St. Louis, Mo. COLLECT

MISSISSIPPI VALLEY EQUIPMENT CO.
1906 Railway Exchange Bldg.
St. Louis 1, Mo. CHestnut 1-4474

EUCLID'S

FOR SALE

22-Ton Rear Dumps
5—46 TD
5—38 TD
5—51 TD

EUCLID DIV. GMC — IRON RANGE BRANCH
HIBBING, MINNESOTA
PHONE - AM 3-7507

BUY SELL RENT

USED STEEL

Beams—Pipe & Casing—Plate—BP's—RR Trestles—Bridges

LEOPOLD COHEN IRON CO.
3000 S. Kedzie Chicago 23, Ill. BI 7-6836

WANTED

5A-920, 1020, 1120 & 1220 Fuller Transmissions & parts
Euclid loader, junk for parts
Euclid loader belts
Euclid parts, Mail inventory
Tires 27:00 x 33, 30 ply rock lug
Scales 100 Ton min portable
Bridge crane overhead 15 to 30 ton
Mixer 6½ yard Challenge truck
Pump 8" self priming no engine
Apron feeder 36" wide 6-10 feet
Manhole form 4' conc. pipe style
Electrical Boxes for 10 to 30 Hp. motors 3 phase 440 volts
150 HP Electric Motor 440v-60-3

FOR SALE

5—FDT Euclid Bottom dumps Side boarded to 17 struck
1—671 GMC 75KVA electric set 3/220-440/60 cycle
1—337 Cat 150 KW same
1—1201 Lima crane parts

HOLLAND CONSTRUCTION CO.
1121 So. 3rd
Bozeman, Montana

FOR SALE
MANITOWOC'S

1 Model 4500 Manitowoc Dragline - 6 Yard
1 Model 3900-B Crane, Drag, Clam.
1 Model 3000-B Manitowoc Erec. Crane, 140' Boom-Jib.
1 Model 3000-B Manitowoc Shovel.
1 Model 3500 Manitowoc Shovel.
1 Model 1201 Lima, Crane, Dragline.
1 Model 375 Link-Belt Dragline.
1 Model 111 Marion Shovel.
1 Model 605 Koehring Crane and Clam.
1 Model American 375 Truck Crane, 25 Ton.
1 Model 95 Northwest Drag and Clam Combination.
1 Model Northwest 25 Dragline.
1 Model Lorain K-50 Drag, Clam and Crane.

24-HOUR SERVICE

All Equipment Guaranteed 90 Days

MANITOWOC SALES & SERVICE COMPANY
2288 University Ave. St. Paul, Minn. Midway 6-8889
4541 West 35th State Rd. Cleveland, Ohio FL 1-1800
1420 Ulster St. Denver, Colorado FL 5-2814

1—Used Sealcoat Applicator—seals 100,000 square feet per day—save 75% of labor costs—power brushes and squeegies—excellent condition.
1—101 Adams Grader. $1,800.00.

SPRINGFIELD BLACKTOP, INC.
516 Northwood Drive, Springfield, Ohio

FOR SALE

Koehring 34-E Twin Batch Paver, GM Diesel Power, 600-gal. water tank, Gorman-Rupp Pump. Ready to work.....$15,000.00

Bay City Model T-50, 20-ton Truck Crane-Clamshell, Waukesha Gas Engines, Factory Carrier.....$15,000.00

Allis-Chalmers HD-20G 4-yard Crawler Tractor-Shovel, GM 6-110 Diesel Engine.....$12,000.00

Koehring 304, ¾ yard Shovel-Backhoe combination, Cat D-318 Diesel. Excellent.....$10,000.00

FRANTZ EQUIPMENT COMPANY

50th & Wynnefield Avenue Philadelphia 31, Penna.
Telephone: GReenwood 7-7200

FOR SALE

Pettibone-Mulliken Wheel Loader, Model 175, s/n PM-55144, with Hercules gasoline engine, torque converter transmission, 4-wheel drive. Excellent condition. Less than half replacement price.

Michigan Model 180 Turbo Dozer. New in 1959. Less than ½ price.

IHC TD18 Tractor with Bucyrus-Erie hydraulic bulldozer. Good operating condition. Cheap.

CALL US FOR ANY TYPE OF LATE AND CURRENT MODEL USED AND REBUILT CATERPILLAR EQUIPMENT.

F.O.B. Our Yard

WITT-ARMSTRONG Equipment Co.
P. O. Box 2008 Springfield, Illinois
Phone: KIngswood 4-8401

WE CAN TRAIN YOU FOR BIG-PAYING JOBS as Operators or Mechanics of Heavy-duty Construction and Earth-moving Equipment

OPERATORS CLASSES start every Monday. Learn how to operate heavy road machinery, cranes, bulldozers, etc., by actual "on-the-job" training. 5 to 19 week courses.

MECHANICS CLASSES offer 13½ week intensive course. Learn how to maintain and troubleshoot construction and earthmoving equipment.

Complete catalog and reservation facts FREE. Approved for veterans.

GREER TECHNICAL INSTITUTE
Attn.: K. M. Hutchison
Box 368, Braidwood, Ill.

WE OFFER

Subject to prior sale

New Government Surplus Paving Forms

2,000' of Rex 13" x 14", 340# per 10' section; 4,230' of Rex 14" x 16", 364# per 10' section; 3,250' of Rex 19" x 20", 495# per 10' section	$34,425.00
6,159' of Dowell Baskets (16 bundles of 34 sets), pins included	1,819.00
55 net tons of new Dowell Pins to fit these forms	2,750.00
	$38,994.00

This material is priced at one-half of the Government's cost or $38,994.00, f.o.b. cars, Kansasville, Wisconsin.

WE SOLICIT YOUR OFFERS & INQUIRIES

SOUTHERN TRADING & INVESTMENT CO.
216 West Second Street
Tulsa, Oklahoma
Luther 4-4229

Attention Contractors

1959 Caterpillar	Model D-8	Series H, Bulldozer
1959 Caterpillar	Model D-7	Series D, Bulldozer
1959 Caterpillar	Model D-4	Bulldozer
1959 Caterpillar	Model 463	Tractor Drawn Scraper 19-27 cu. yds.
1959 Allis-Chalmers	Model 315	Tractor Drawn Scraper 15-19 cu. yds.

All Machines available for Rental Purchase, Rental or For Sale. Financing Available.

GIL WYNER CO., INC.
12 Newland St. DA 2-8900 Malden, Mass.

1—Portable Jet Dredge 10" suction—8" discharge, 27' rotary cutter ladder, 2000' of Armco special pipe, dredge sleeves and 70 pontoons. This dredge is complete and ready to run, and has less than 400 hours of operation.
1—Ensley Crawler Dragline, new in March 1960. Model M with a 30' boom, high gantry, and a Cat 318 "G" diesel, has less than 1,000 hours of operation. $25,500.00.
3—25 ton Euclid End Dumps, Cummins 350 h.p. super charged. $8,500.00 each.
1—L90 Lorain 2½ yd. highlift shovel. Cat 17,000. $11,000.00.
1—Lima std. shovel front for a 1201. Like new.
1—Williams Hammermill 36" x 60". Good condition. $6,500.00.
2—Atlas Imperial Diesel Generator sets, 300 h.p. 250 K.W.—A.C., air start, 3 panel switchboard. 3,000 hours. $12,500.00 each.
5—33 cu. yd. bottom dump trailers with Auto Car chasis, with Cummins 250 h.p. engines. The bottom dump trailers have just been completely rebuilt and have new air operated drop bottoms. The tractors are in good condition. The tires are also in good condition. $10,900.00 each, price.

UNITED EQUIPMENT CO.
P.O. Box 844 Peoria, Illinois
Phone 688-2231

FOR SALE

1—LeTourneau Westinghouse "C" Electric Scraper (Low Bowl) S/n GP-40607-CPF-T, 6-71 GM Diesel, 29.5 x 25 Rubber. This scraper rebuilt at 3761 hours. Present Meter reading 4059. This machine is in very good condition. Priced to sell!

1—1949 1¼ Yd. Bay City Combination Shovel and Dragline, Model 65, S/n 5036. Shovel front in almost new condition. Cummins Model HBID Engine. 45' Boom pin connected, 10' insert, 2 sheave boom, 34" pads. Cab. This machine is in good condition. Priced to sell!

SUPERIOR EQUIPMENT CO., INC.
Powers, Michigan
Phone: HX 7-5296

Pumpcretes For Sale

3—160 Single Rex Pumpcretes, all with remixers, auxiliary equipment and plenty of 6" pipe.

1—200 Single Rex Pumpcrete with remixer, auxiliary equipment and 8" pipe.

Machines completely reconditioned and in A-1 condition.

Write or Call

C. H. & L. MACHINERY CO., INC.

P. O. Box 9218 Phone CY 2-4132

Nashville, Tennessee

KTV TOWERS

are SAFE in winds up to 80 m.p.h. faster installation . . . much longer life.

- For Hams
- For Research at Schools
- For Geodetic Survey
- For Wind Measurement
- For Antenna Testing
- For Government Research

We also have heavier towers available for Communication work.

SEND FOR ILLUSTRATED FOLDER

KTV TOWER and COMMUNICATION EQUIP. CO.
P.O. BOX 294 • SULLIVAN, ILLINOIS

FOR SALE

30 x 42 Iowa Portable Impact Crusher, 3 x 12 feeder, 30" discharge belt, tandem axle. Price $18,000.00
#25 Northwest ¾ yd. Shovel with Cummins diesel. Price $7,500.00
#610 Adams Grader, 14:00 x 24 tires, full power diesel engine, cab and heater. Price $8,000.00
Link-Belt ½ yd. Hoe and Crane Combination, diesel engine, power boom and Speed-O-Matic Control. Price $7,500.00
Lima 34 Dragline, extra long and wide tracks, 50 ft. boom. 1 yd. Page ditch bucket and Cat. power. Price $9,500.00
Three (3) LeTourneau "C" Pulls, 1953 and 1954 Models, GMC diesels, sideboards and cabs. Price .....$8,500.00 each
The above equipment is in very good operating condition and is located at our shop or working nearby.

KEESEN CONSTRUCTION
RFD #1 Rochelle, Illinois
Phone 849

FOR SALE
Gooseneck Trailers

1 - LaCrosse 50-Ton Drop Side Deck Removable Gooseneck Trailer. Excellent condition.
1 - LaCrosse 35-Ton Removable Gooseneck Trailer. Excellent condition.

WE ALSO
Carry a Large Selection of Used Trojan Front End Loaders.

Hodge & Hammond, Inc.
720 Garrison Ave. - Phone KIlpatrick 2-2400
New York 59, New York

U. S. Army Tool Chest

65" Long
17" Wide
17" Deep
¾" Marine Plywood • All Steel Trimmed • Weather Proof

Cost Gov't. $48 Worth A Lot More
PROTECT YOUR TOOLS ON ALL JOBS
$9.50 ea. Used Excellent 2 for $18.00
Exp. Chg. Coll.
222 N. 22nd Street
Philadelphia 3, Penna.
J. Jacob Shannon & Co.

FOR SALE

One (1) Worthington-Ransome Single Drum, Hercules Gasoline Power. Entire Unit in Excellent Condition $9,000.00

(1) 32-M Marion Crane-Dragline

Caterpillar D-318 Engine, 40' independent boom - Long tracks, 30" shoes. Excellent buy. F.O.B. Cars, Memphis, Tennessee $15,000.00

Hawkins Equipment Co.
1475 Thomas St. P.O. Box 4695
MEMPHIS 7, TENNESSEE

WANTED

Bulldozer D6 or D7 or equivalent, with swamp tracks for use on Peat Bog.

SAM BEEMSTERBOER
11732 S. Yale Avenue
Chicago 28, Ill.
Phone - Pullman 5-6000

Clearing House Ads Bring Results

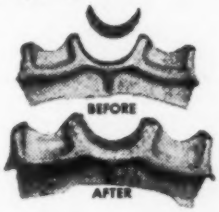
1 Fordson Tractor 800 with power steering and Shawnee front end loader (industrial) and Blackhawk Model BTW trencher, new condition, cuts from six to twenty two inches, five and one half foot depth. Has new dozer blade and misc. spare parts. Total price $5000. 2 Hobart 200 amp welders on skids, powered by Willys 4-cylinder motors, total price each $425. 1 Hobart 400 amp welder on rubber powered by Chrysler Industrial eight cylinder motor. Total price $875. 1 Graco lubricating unit for greasing, etc. in field, complete with Wayne compressor, gas engine, tanks, hose, etc. Total price $475. 1 Allis-Chalmers 150 hp electric motor, 60 cycle, 220 volt, 1760 rpm, three phase, total price $385. 1 winch truck, Chevrolet, 1951 flat bed, looks like new, condition excellent, nylon tires, power brakes, heater, turn signals, west coast mirrors, 30,000# Braden winch. Total price $875. 1 dry quick controlled paint baker, ideal for paint shop. Model 16, 220 volt, 1 phase, 24 element, on casters. Total price $265. 1 electric 2-drawer National cash register with tape, etc. Total price $250. 1 air compressor, powered by single phase 1½ hp motor, good shape. Total price $175. 2 Ford diagnosis machines, $95.00 each. 2 Ford distributor stroboscopes, $95.00 each. New 100# Blacksmith anvils, $18.75 each F.O.B. H&H. Distributing Co., South Main Street, Phone 4, Linton, Ind.

SAVE

With High Carbon
Wear Resistant Weld-in

Sprocket-Cups

A fraction of the cost of New Rim or New Sprocket. No need to remove sprocket



$39 Per Sprocket

FOR ALL MODELS OF CRAWLER TRACTORS
(except TD24-HD20 and D9—these at $75.00 Per SPROCKET)

— DISCOUNT TO DEALERS —

Dakota Tractor Equip. Co.
WEST MAIN - FARGO, N. D.

Used Equipment Bargains

2—Barber-Greene Undercar Unloaders, 220V, 60-cycle, 3-phase, electric motor drive. Excellent condition.

2—Gallon Trench Rollers, gasoline powered. Excellent Condition.

1—3,000 gal. South Bend Asphalt Distributor, new Continental engine, mounted on Edwards tandem-axle semi-trailer.

1—Hetherington & Berner Moto-Patcher, portable asphalt plant, 10 ton per hour w/kerosene burner, powered by Briggs & Stratton gas engine.

1—Highway Towed-Type Asphalt Spreader.

1—Case Heavy-Duty Industrial, Rubber-tired, Front-End Loader and extra Bulldozer Blade.

1—Good Roads 10' Chip Spreader.

1—Bros. Portable, 2-car Tank Car Heater.

1—Link-Belt 2 deck, 4' x 5' Vibrating Screen w/o power.

1—3-Ton Tandem, Flatwheel Roller, water-cooled engine.

1—Worthington Model 105 Compressor. Good Condition.

1—Tampo 10-Ton, 13 Wheel, Towed-type Roller.

E. K. S. Equipment Company
GRAND RAPIDS 4, MICHIGAN
1727 Alpine Avenue, N. W.
Telephone RI 2-2451

BACKHOE ATTACHMENTS

Lima 34 Camelback—New	$2650.00
Lima 604 Camelback—New	6000.00
P & H 255 Camelback—New	2750.00
P & H 655—New	2900.00
Bucyrus-Erie 15-B—New	1650.00
Bucyrus-Erie 10-B—Used	1150.00
Bucyrus-Erie 22-B Camelback	2350.00
Bucyrus-Erie 22-B Straight	1750.00
Northwest 6 Camelback New	7000.00
Lorain 820 Camelback—New	4750.00
Lorain 50 Camelback—Used	3200.00
Lorain TL-25 Camelback—Used	1750.00
Bay City ½ Yd—New	1650.00
Koehring 304—New	1950.00
Bucyrus-Erie 38-B—Used	4650.00
Insley "L" Camelback—Used	1850.00
Manitowoc 3000 Camelback—New	6000.00

Also, Crane Booms & Fairleads for the above machines.

A. C. R. Equipment Company
19615 Nottingham KEnmore 1-8000
Cleveland 10, Ohio

8000 CANDLEPOWER

CARBIDE FLOOD LIGHTS • COSTS LITTLE TO OPERATE • GENERATES OWN GAS

Portable Illumination—Where and When You Need It
• MARINAS • AIRFIELDS • BALLFIELDS
• RESCUE WORK • SALVAGE WORK

Operates in hot, also freezing weather, rain, sleet, hail, wind. 13" dia. reflector—sturdy welded const. Heavily galvanized. Free of smoke and sparks. 2 designs to choose from.

Carbie Floodlight Round Tank, 100 lb. drum 20 carbic cake contains 40 cakes—cost $9.10 cwt. 1 cake with water keeps light burning approx. 3 hours. Milburn Floodlight Square Tank. 4 carbic cakes with water will burn approx. 12 hours — $9.10 cwt. Carbic cakes can be purchased locally.

12.50 EA.
EXP. CHG. COLL.

J. JACOB SHANNON
218 N. 22nd St., Philadelphia 3, Pa.
Expressway to 23rd St. Exit Direct—No City Traffic

FOR SALE

TRUCK CRANE

New 25 ton Insley 90' Boom, 30' Sectional Jib, all extras including Folding & Floating High Gantry, Power Load Lowering, Screw Jacks & Floats, at dealers cost F.O.B. Philadelphia. Good rental and recapture deals accepted.

HOE & BOOM COMBINATION

Used 10B ⅜ yard Bucyrus. Crawler mtd., gas eng. powered, $4,200.

BACKHOES

Used but completely rebuilt K-12 Insley. New pads, rollers, drive sprockets and tumblers. $9,000.

Two year old K-12 Insley, G.M. Diesel powered, reconditioned and raring to go. $11,000.

(2) used TL-25 Lorain. Reconditioned, take your pick, $5,000.

LINK-BELT

K-360 with unused shovel front and 60' boom, used for hookwork and pile driving. Cat Diesel Engine, Ind. Boom Hoist combination, ready to work .....Price $15,000.00

ALEXSON EQUIPT. CORP.
1331X W. Cumberland St., Philadelphia, Pa.
BAldwin 5-5350
and 2935V Washington Blvd.,
Baltimore, Md. — Circle 2-9200

MIXERS

Rex 3—4¼ Yd. Mixer, Chrysler; on I-H LF 172 Tandem @ $1,750.

Smith 5—6⅛ Yd. Mixer, Continental, @ $1,500. Blasted—Painted—Rebuilt.

Rex 6—7 Yd. Mixer, Chrysler; on I-H LF 190 Tandem. Perfect.

EIGHMY EQUIPMENT COMPANY

Pierpont at W. State St. WO 4-6706

ROCKFORD, ILLINOIS

DIESEL TRACTORS

10—1955 & 1955 R.D. 205 Internationals with J. T. Cummins Engines with Tag Axles.

4—1954 R.F. 195 Tandems 175" wheel base with 8 to 10 yard dump bodies.

A. J. RHIAN

International Truck Dealer
Phone NO 5-2527
YANKTON, SOUTH DAKOTA

FOR SALE

Priced to Sell

¾ Yard P&H Shovel, Backhoe, Crane Combination. Also L.P. Scoop.

SAM BEEMSTERBOER
11732 So. Yale Ave.
Chicago 28, Ill.
Ph. Pullman 5-6000

FOR SALE

1926 Link Belt "Grizzly" crawler loader, equipped with swivel chute, 30 HP Buda Gasoline Engine. $500.00

Vertical tubed boiler with approx. 170 new seamless steel boiler tubes (not installed) size 2" OD x 11 Gauge x 6'0" Long. Boiler & tubes. $500.00

1½ cu. yd. horizontal Jaeger mixer mounted on 1941 White truck. $650.00

STANDARD SAND & GRAVEL COMPANY
34th & Market Sts.
Wheeling, W. Va.

ALL WHEEL DRIVE TRUCKS,

Bulldozers,
Cranes & Parts.

•

Impartial Inspections & Appraisals
Made Anywhere - Anytime.

•

I can supply any type of Eqt. if it has been sold by Uncle Sam as Surplus.
Try me and see!

•

Quotes made promptly to all interested buyers.

•

No order too small to receive prompt attention.

•

Only the best reprocessed Eqt. sold at reasonable prices.

•

Satisfaction guaranteed.

•

CALL - WIRE - WRITE

CHARLES SMITH

P. O. Box 231
Silver Spring
Maryland

Telephone
Washington, D. C.
Lockwood 5-5721

Unused PILE DRIVING OUTFITS

Less Than One-Half
New Price

GOVT. SURPLUS
FINEST QUALITY

with 16' leads, 2000# hammer $600
with 26' leads, 2000# hammer $700

COMPLETE WITH
CAP. CATWALKS
F.O.B. Kansas City

Extra New 2000# Hammers
$200.00 each

WENZEL MACHY. CO.
565 S. 10th St.
Kansas City, Kans.
Mayfair 1-1710

FOR SALE

Lorain Model 56, 1 Cu. Yd. Cap. Crawler Crane Special 14 Ft. Swamp Cats., Diesel Engine, 70 Ft. Boom, Worked Six Months, Tremendous Sacrifice.

MIDBORO CONST., CORP.
1163 61st St., BROOKLYN, N. Y.

See New
Product Announcements
Beginning on Page 130

AAPT

Special report on AAPT Charleston meeting, By H. G. Nevitt

Continued from page 129

base design to avoid flushing and other problems, also adequate construction, particularly in compaction and layer thickness, so that the intended results will be obtained. Warden discussed past experience on certain projects and summarized his conclusions concerning design and control utilizing the usually available type of aggregate. Martin discussed successful construction experience, and later observations with crushed stone aggregates utilizing both open and dense gradations, indicating some preference for the latter which was confirmed in the discussion. Ellison described Virginia's successful experience with these bases and their bright future in his state, with much comment on the design and construction.

The panel was unanimous in its agreement that the use of black bases will rapidly increase, while stressing the need for better understanding of their design and construction requirements. The discussion mainly detailed and clarified the points made, with the optimum aggregate size desirable for black bases still apparently not clear. There seems to be general agreement however as to the optimistic view of the panel on the bright future of black bases.

This meeting gave further evidence of the increasing attention to asphalt paving technology. The problems are being more closely scrutinized and broken down to disclose the caustive factors. In due course these causes will be understood and controlled. On the other hand some serious problems are appearing, and this meeting served to emphasize them. A typical example is the use of the Marshall method. In every discussion involving Marshall stabilities the point was continually made that, while the method might have much use for empirical designs, field control and similar, these values gave no indication of bearing value. In fact one engineer active in the development of the technique stated that its main benefit to the designer was in determining the asphalt content —a point which incidentally would be challenged by proponents of some other techniques. Yet practically all the laboratory studies reported on at the meeting used the Marshall method as the evaluating tool.

Observers at Charleston asked, how can results which cannot be taken as an indication of support value serve as a guide for the evaluation of aggregates, the comparative merits of fillers, or similar factors whose function is to improve the support value?

Apparently much laboratory effort will be wasted unless techniques which directly measure functional suitability are utilized as evaluating tools. This is getting some indirect recognition in the asphalt tests—at least measurement of fundamental properties (though not necessarily of clear functional significance) expressed in scientific units is being stressed—but little progress along this line is evident on the paving characteristics proper.

Georgia Plans Large Maintenance Program

A $100 million program of widening and resurfacing is planned by the state highway department for 1961. The plan requires authorization by the legislature, whose members are reported to be generally favorable. The sum asked takes in all the main highways and some secondary roads. The work would come under the recent constitutional amendment approved by Georgia voters that will make possible authority-type financing of road maintenance.

Contracts would be awarded beginning in April at $10 to $15 million per month. The entire program would take about 18 months to complete, with priority based on current traffic loads.

Contractor Qualification

The Virginia department of highways has revised its contractor prequalification procedure. It now provides classification of contractor capability by a new three-member committee composed of a representative of the chief engineer's office, a representative of the Construction Division and the fiscal director.

Manufacturers' Literature

FLARE CATALOG: A new 16 pg. catalog showing the entire line of Esco Flare warning lights and barricades has been announced by the Electronic Specialties Co., Batavia, Ill.

Complete specifications and description copy for every type of transistorized light made by Esco—for construction, utilities, municipalities and other similar applications that require a bright, flasher warning light—are listed.

For more details circle 178 on Enclosed Return Postal Card.

Convenience Comfort, Economy Anywhere in
ST. LOUIS

HEART of ST. LOUIS
108 N. Kingshighway
Facing beautiful Forest Park
Hotel Ambassador
One of St. Louis' finest hotels — 300 rooms & suites — completely air-conditioned. T.V.
Fine Convention Facilities.
Free Parking.
Rates from $6.

DOWNTOWN
11th and Pine
HOTEL DeSOTO
Steps from Business & Shopping area. 250 fine rooms. Air-Conditioned.—T.V.
Rates from $5
Free Parking

NORTH SIDE
Natural Bridge at Spring
Overlooking Fair Grounds
Hotel Fairgrounds
Two blks. from Busch Stadium — Nat'l. League Baseball Park.
250 rooms with bath.
Air-Conditioned. —T.V.
Rates from $5
Free Parking.

FREE PARKING
B. H. TUREEN HOTELS

SOIL-CEMENT SHOULDERS: A new motion picture describing the use of soil-cement pavement in construction of highway shoulders has been released by the Portland Cement Assoc., 33 W. Grand Ave., Chicago 10, Ill.

Titled "Soil-Cement Shoulders for Modern Highways", the 10 min. 16mm sound and color film illustrates soil-cement shoulder practices in various parts of the country, both on the interstate system and primary highways. The motion picture also includes a typical modernization project in which a dangerously low shoulder along an existing highway is rebuilt.

For more details circle 165 on Enclosed Return Postal Card.

GRADING: The possibilities of motor graders as all-around production tools are reviewed in a new 12 pg. brochure entitled "Production Grading", prepared by Caterpillar Tractor Co., Peoria, Ill.

While finish grading is the most common application for a grader, the booklet points out, it should not be overlooked for spreading fill or for haul road maintenance. An even range of tasks can be handled with the addition of special attachments. Importance of haul road maintenance is illustrated by two graphs, which indicate that production gains of as much as 5 yd. per hr. on a 1,000 ft. haul result from a speed increase of one mph. Travel speeds often can be boosted from 3 to 5 mph. with nominal attention to haul road maintenance.

For more details circle 166 on Enclosed Return Postal Card.

BRIDGE CONCRETE PROBLEMS: Case history reports of more than 200 bridge concreting problems and how they were solved are studied in a 16 pg. publication, MBR-P-11, available from Master Builders, Cleveland 18, Ohio.

Stories of the great variety of job and weather conditions common to bridge construction portray the part played by Pozzolith concrete in meeting these conditions. Included are reports on concreting of piers and bridge decks for highway and railway bridges, hot and cold weather data, the use of lightweight aggregate and placing and finishing problems.

For more details circle 167 on Enclosed Return Postal Card.

CONCRETE FORM CATALOG: The 1961 catalog of forms is reported available from Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill.

Forms, form ties, accessories, construction specialties and highway products are well illustrated and described in this new 56 pg. catalog.

For more details circle 168 on Enclosed Return Postal Card.

NF
name's
NEENAH
and
the
products
are
GRAY and
DUCTILE
IRON
CONSTRUCTION
CASTINGS
of finest
QUALITY
FINISH
UNIFORMITY

Delivery is prompt: we have huge on-hand stocks of standard items
PLUS
15,000 patterns
PLUS
a daily production capacity of 500 tons in our two plants.

Name's Neenah . . . if we make it it's a casting . . . and the best.

New 168-page catalog shows our line. It's sent promptly when requested.

NEENAH FOUNDRY COMPANY
NEENAH • WISCONSIN
Chicago Office
5445 North Neva Ave., Chicago 31, Ill.

. . . for more details circle 341 on enclosed return postal card

Only Maginniss

Powr-Pactor

PATCHES ASPHALT FASTER . . .

Maginniss *vibratory* compactors speed placing and patching of blacktop . . . are easily moved from job to job . . . work fast, at speeds up to 50 ft. per minute. Water feed prevents asphalt adhesion . . . assures smooth finish.

Put Maginniss Powr-Pactors to work on your blacktop jobs. The increased production, lower costs and small initial investment will surprise you. Call your Maginniss distributor today!

WHERE TO USE IT:

Asphalt Driveways and Sub-Base
County Roads, sub-base and asphalt maintenance.
State Roads, sub-base and asphalt maintenance.
Highway Pavements, sub-base.
City Street Paving, around manholes and places hard to "get at" with a roller.

Maginniss HI-LECTRIC POWER TOOLS

Find your nearest distributor in the Yellow Pages.

MAGINNISS POWER TOOL CO.
154 Distl Avenue, Mansfield, Ohio

Manufacturers' Literature

PUMP PERFORMANCE: The publication of a new 8 pg., color bulletin containing specifications, performance, a cross-section drawing and applications of the Gorman-Rupp 3 in. electric motor driven submersible dewatering pump has been announced by the Gorman-Rupp Co., 305 Bowman St., Mansfield, Ohio.

For more details circle 169 on Enclosed Return Postal Card.

SOLDERING TIP: A new catalog showing Hexclad and Xtradur lines of Long-Life iron coated soldering tips has been published by Hexacon Electric Co., 236 W. Clay Ave., Roselle Pk., N.J.

The new line of Durotherm nonsticking iron coated tips is also shown. In addition to detailed specifications for each of the three types of tips, sketches of the many different point shapes are shown. Style of point, tip point size and overall length for hundreds of different tips are shown in tabulated form. The tabulation also indicates the catalog number each different tip fits.

For more details circle 170 on Enclosed Return Postal Card.

MOISTURE TESTER BULLETIN: Checking moisture content of soils and similar materials can now be accurate, fast and complete as described in a new two pg. bulletin, C-115-60, available from Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill.

Covering their line of Speedy Moisture Testers, the bulletin contains complete information on the equipment specifications as well as the instructions for use. Complete tests can be made in 1 to 3 min. On most materials accuracy can be achieved to within 0.5 percent of moisture content, reports Soiltest.

For more details circle 171 on Enclosed Return Postal Card.

AIR POWERED BORING: The Ka-Mo A-20, a light weight air powered boring unit capable of augering 2¼ to 16 in. dia. is the subject of a new bulletin released by the Kwik-Mix Co., Port Washington, Wis.

The new bulletin illustrates and describes the A-20, presents a capacity chart and discusses various tract and optional combinations.

For more details circle 172 on Enclosed Return Postal Card.

STABILIZED ROADS: The construction of bituminous stabilized roads is covered in a new 8 pg. booklet entitled "Sta-Bilt Method Provides Long-Life Roads at Tremendous Savings".

It shows how the in-place blending of native material, aggregate and emulsion provide low cost, low mainenance, long-life roads. The equipment required, the procedures involved and recommended binders suitable for bituminous stabilization are all covered in this booklet, available from American-Marietta, Const. Equip. Div., Milwaukee 1, Wis.

For more details circle 173 on Enclosed Return Postal Card.

ASBESTOS-ASPHALT MIXES: Two new technical bulletins on the use of asbaltic asbestos fiber in asphalt mixes are now available from Jonas-Mansfield, Asbestos Fiber Sales, Research Center, Manville, N.J.

AFD-17A covers the application of asbestos fiber to dense graded asphalt paving mixes. AFD-18A covers the application of asbestos fiber to asphalt curbing.

For more details circle 174 on Enclosed Return Postal Card.

AIR TOOLS CATALOG: A new 48 pg. catalog on contractor and mining air tools manufactured by Thor Power Tool Co., 175 N. State St., Aurora, Ill. is now available.

The well handled catalog, No. 46, carries a complete lineup of Thor tools for contractors, road builders, and tunnel builders. Neat, detailed diagrams show features of tools. Complete specifications are given on each model shown.

For more details circle 175 on Enclosed Return Postal Card.

TRUCK SELECTION: A booklet showing how proper truck selection, operation and maintenance can produce substantial savings in the face of mounting transportation costs is being distributed by GMC Truck & Coach Div., Pontiac 11, Mich.

Titled, "Basic Considerations in the Selection, Operation and Maintenance of Motor Vehicles", the study emphasizes the importance of getting the right truck for the job. The booklet stresses the initial cost plus operation as the total cost over the life of the truck.

For more details circle 176 on Enclosed Return Postal Card.

HIGH PRESSURE SPRAYERS: Sprayers ranging in capacity from 3 to 60 gal. per min. with tank sizes from 10 to 1000 gal.—60 different models, are illustrated and described in 3 new catalogs from John Bean, Food Machinery & Chemical Corp., Lansing, Mich.

The "All Purpose Sprayers" catalog covers the smaller capacity sprayers. Two other catalogs cover the mid-range and high capacity sprayers.

For more details circle 177 on Enclosed Return Postal Card.

. . . for more details circle 340 on enclosed return postal card

With the Manufacturers

KAISER ALUMINUM & KAWNEER: An agreement on a merger between Kaiser Aluminum and Kawneer was announced by those companies. Kawneer will be merged into Kaiser. The Kawneer organization manufactures aluminum architectural components.

MINNEAPOLIS-MOLINE: Stockholders of Minneapolis-Moline Co. approved a change in the corporation's name to Motec Industries, Inc. The company reports the name change was made so that the corporate name would reflect the diversified activities now characteristic of the company.

ATLAS COPCO: At a board of directors meeting recently, Howard C. Sheperd was named chairman of the board. Mr. Sheperd was formerly chairman of the First National City Bank. At the same meeting Peter Redpath was elected president.

HARNISCHFEGER: More than 300 construction executives from the U.S. and several other countries met for two days in March in a summit meeting termed "Operation Survival." Harnischfeger sponsored the meeting in a decisive effort to strike back at a serious recession being felt throughout the construction industry.

MACK TRUCK: The appointment of A. G. Crockett as general sales manager for Mack Trucks, Inc. was recently announced by the company. Crockett was formerly director of sales development for Mack. Assisting Crockett will be Wallace Hallan, recently of the Atlantic Div.

FRUEHAUF TRAILERS: Norman A. Rowe, director of advertising and public relations for Fruehauf Trailer Co. passed away March 3 after suffering injuries in an auto accident. The 49 year old executive had been associated with the transportation industry for 33 years, 25 of those with Fruehauf.

VEON-WEST CORP.: Arrangements have been completed with Veon Chemical Corp for the exclusive national manufacture and distribution of Perma-Line Thermoplastics striping materials and equipment by the Veon-West Corp.

FWD CORP.: The purchase of all the capital stock of Wagner Tractor, Inc. has been completed by the FWD Corp. of Clintonville, Wis. Wagner will continue to operate, but as an FWD wholly owned subsidiary under the direction of M. E. Ash, FWD president.

Machinery Distribution Scholarship

The Clarkson College of Technology, Potsdam, N.Y., recently acknowledged the contribution made by Ralph L. Johnson, president of H. O. Penn Machinery Co. to that school's scholarship fund.

Clarkson is the first in the country to offer specialized four year training to men interested in construction machinery distribution. Also offered at Clarkson are courses in Civil Engineering for those entering the actual construction field.

Preferential consideration for the scholarship from Penn will be given to relatives of Penn employees and relatives of customers residing in Connecticut or the 13 lower tier counties of New York. Interested parties are instructed to contact A. V. LaPenna, company vp.

The aim of the college selection board is to offer at least 6 four year scholarships of $3,400 each all available from pledged sources.

Various machinery distributors throughout the county offer summer employment to students and during the last two years field trips to distributor plants are scheduled to give students a first hand inspection of special problems.

IDEAL FOR... PLAT PLANS PROJECT PLANTS

File constructed in 200 lbs. test corrugated container.

9 TUBE MODEL Tube I. D. 4⅛"			
MODEL NUMBER	0930	0936	0942
Size 13½x13½xL	31	37	43
Inside depth	30½	36½	42½
Price	$11.50	$12.00	$12.50

16 TUBE MODEL Tube I. D. 3⅛"			
MODEL NUMBER	1630	1636	1642
Size 13½x13½xL	31	37	43
Inside depth	30½	36½	42½
Price	$12.00	$12.50	$13.00

Color Med. Gray • F.O.B. St. Clair Shores, Mich.
SOLD DIRECT ONLY
25 and 49 Tube model avail. Write for brochure.

ROLL & FILE SYSTEMS, INC. P. O. BOX 3863 DETROIT 5, MICH.

. . . for more details circle 345 on enclosed return postal card.

FOR
fun
IN
FLORIDA
VOYAGER
Resort Motel
Miami's new and beautiful motel providing fine HOTEL services. Deluxe rooms and studio apartments, private pool, free recreation and entertainment, close to all points of interest. Dancing nightly. Restaurant on premises. Credit cards honored.
12350 Biscayne Blvd. (U.S. 1)
MIAMI
FREE!
Write for literature and new TRAVEL GUIDE listing fine motels from coast to coast, inspected and approved by Congress of Motor Hotels.
TRAVEL GUIDE
CONGRESS

Your First Step to Unbelievable Luxury

In Chicago...

Tomorrows Motel...Today
. . . overlooking Chicago's beautiful Lake Front
• All rooms air conditioned and include TV and AM-FM Radio
• Ample Free Parking
• 10 minutes north of Loop
• Restaurant & cocktail lounge
• Heated Pool
4800 N. MARINE DRIVE
(West Lawrence Turnoff & Outer Drive)
Phone BRoadway 5-3000
Teletype CG-577
ANTHONY MARSH, General Manager

Holiday Lodge
4800 N. MARINE DRIVE
• BRoadway 5-3000

Index to Advertisers

A & M Mfg. Co., Inc. 165
Acme Iron Works 162
A.C.R. Equipment Company 173
Adams Machinery, Inc. 166
Allis-Chalmers ....72 & 73
Alpha Portland Cement Company 150
American Bitumuls ....120 & 121
American-Marietta 10
Asphalt Institute ....86 & 87
Asphalt Paving Co. 163
Axelson Equipt. Corp. 173

Baker, Peter, & Son 163
Barber-Greene Company 127
Bar-Coat Blacktop Co. 167
Bay City Shovels, Inc. 18
Beasley, Miller C., Machinery Co. 168
Beemsterboer, Sam 172, 173
Bethlehem Steel Company ..3, 106 & 107
Blaw-Knox Company ....92 & 93
Boers, Gil, Equipment Company 165
Bros Incorporated 149
Buteyn Excavating & Grading 163

Carolina Equipment and Parts Company 170
Caterpillar Tractor Co. ....64 & 65, 159
Central-Reynolds Company, The 33
Chain Belt Company 81
C. H. & L. Machinery Co., Inc. 172
Chapin Cylinder Head Co. 169
Childers Manufacturing Company, Inc. 50
Clark Equipment Company—Construction Machinery Division ....154 & 155
Cleaver Brooks Company 128
Cleveland Trencher Co., The 97
Cohen, Leopold, Iron Co. 170
Colorado Fuel & Iron Corporation, The 160

Dakota Tractor Equip. Co. 173
Dallas Brush Manufacturing Co. 164
Dean, Warren E. 170
Dixon Valve & Coupling Co. 38
Dravo-Doyle Co. 164

Eighmy Equipment Company 173
Eimco Corporation, The 31
E.K.S. Equipment Company 173
Ensminger & Co., Inc. 164
Esso Standard Division of Humble Oil & Refining Company 117
Etnyre, E. D. & Company 119
EUCLID Division of General Motors Corporation ....14 & 15, 40 & 41
Euclid Div. G.M.C.—Iron Range Branch 170

Firestone Tire & Rubber Company 11
Fishel, Bill 168
Ford Motor Company—Industrial Engine Department 108
Ford Motor Company—Tractor and Implement Division 131
Ford Motor Company—Truck Division ....16 & 17
Forke Brothers 167
Forney's Inc. 153
Frantz Equipment Company 171
French, James C. 164, 167
Frink Sno-Plows, Inc. 36
Fuller Transmission Division, Eaton Manufacturing Company 51

Galion Iron Works & Mfg. Co. ..134 & 135
Gallagher Asphalt Corporation 166
General Motors Corporation, Chevrolet Motor Division ....142 & 143
General Motors Corporation—EUCLID Division ....14 & 15, 40 & 41
General Motors Corporation, Truck & Coach Division ..21, 22, 23, 24, 25, 26, 27, 28
Gilson Screen Co. 42
Gold Coast Equipment Co., Inc. 165
Goodrich, B. F., Tire Company, The ....90 & 91
Goods Roads Machinery Corporation 129
Greer Technical Institute 171

H & H Distributing Co. 172
Hawkins Equipment Co. 172
Highway Equipment Company 151
Hodge & Hammond Inc. 172
Holland Construction Co. 171
Hotel Ambassador 175
Hotel Holiday Lodge 177
Hotel Voyager 177
Hough Co., The Frank G. ..44, 45, 46, 47
Huber-Warco Company 69
Hyster Company—Tractor Equipment Division ....138 & 139

Ingersoll-Rand Company 5
International Harvester Company—Construction Equipment Division ....84 & 85, 147
International Harvester Company—Farm Equipment Division .Third Cover
International Harvester Company—Motor Truck Diviison ....98 & 99
Interstate Equipment Co. 163
Iowa Manufacturing Company ...52 & 53

Jackson Vibrators, Inc. ....Second Cover
Jaeger Machine Company, The 32
Josh Steel Company 169

Keesen Construction 172
Kennedy's Van Brush Mfg. Co. 162
Kent Piling Co., Inc. 170
Koehring Company—Buffalo-Springfield Division 77
Koehring Company—Flaherty Department 6
Koehring Company—C. S. Johnson Division 7
Koehring Company—Koehring Division ....110 & 111
Kolman Manufacturing Co. 164
Kotal Company 132
K.T.V. Tower and Communication Equip. Co. 172

LaClede Steel Company 156
Lake Crystal Construction Machinery Co. 166
Larson Construction Company 165
LeTourneau-Westinghouse Company ....34 & 35, 37
Lima Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corporation ....12 & 13
Link Belt Speeder Corporation ..48 & 49
Littleford Brothers ....113 & 114
Lubrecht, William III, Construction Equipment 167
Lufkin Rule Company 137

McConnaughay, K. E. 124
McElroy Transport Co. 169
McGee Trucks, Inc. 167
Maginnis Power Tool Company 176
Maintenance Co., Inc., The 167
Manitowoc Sales & Service Company ..171
Michigan Industrial Finishes Corp. 170
Midboro Const. Corp. 174
Mississippi Valley Equipment Co. 170
Mutual Truck Parts Co., Inc. 168

National Schools of Construction, Inc. ..169
Neenah Foundry Company 175
Northwest Engineering Company 54

Parts Suppliers of Miami, Inc. 167
Pettibone-Mulliken Corporation 144
Pettibone Wood Manufacturing Company 43
Portland Cement Association 105
Port Toledo Steel Co. 170

Reid-Holcomb Co., Inc. 168
Reo Division, White Motor Company . 95
Rhian, A. J. 173
Roll & File Systems, Inc. 177

Shannon, J. Jacob 173
Shannon, J. Jacob, & Co. 172
Sheffield Division, Armco Steel Corporation ....100 & 101
Smith, Charles 174
Southern Engineering & Construction Corp. 166
Southern Trading & Investment Co. ..171
Springfield Blacktop Co. 171
Standard Sand & Gravel Company 173
Standard Steel Corporation 29
Standard Steel Works 123
Stoody Company 78
Superior Equipment Co., Inc. 172
Swabb, Frank, Equipment Co., Inc. 164
Symons Clamp & Mfg. Co. 141

Tarrant Mfg. Company 129
Texaco Inc.—Asphalt Sales Division ..148
Texaco Inc.—Lubrication Division .8 & 9
Timken Roller Bearing Company ....Fourth Cover
Trinity Dam Contractors 163
Troyer, Stanley B., Equipment Co. 169

Udelson Equip't Co. 164
United Equipment Co. 172
United States Steel Corporation 18a, 18b, 18c, 18d
United States Steel—American Bridge Division 18a, 18b, 18c, 18d
United States Steel—American Steel & Wire Division 18a, 18b, 18c, 18d
United States Steel—Columbia-Geneva Steel Division 18a, 18b, 18c, 18d
United States Steel—Consolidated Western Steel Division 18a, 18b, 18c, 18d
United States Steel—National Tube Division 18a, 18b, 18c, 18d
United States Steel—Tennessee Coal & Iron Division 18a, 18b, 18c, 18d
United States Steel—Universal Atlas Cement Division 18a, 18b, 18c, 18d
United States Steel Supply Division 18a, 18b, 18c, 18d

Vandeventer Auto Sales 168
Veteran's Excavating Company, Inc. ..168
Vivian Equipment Co., Inc. 164

Wainer Brothers, Inc. 169
Warehouse Sales & Salvage Co. 168
Weirton Steel Company, Division of National Steel Corporation 30
Wenzel Machy. Co. 174
Western Services Corporation 167
White Mfg. Co. 125
Whiting Construction Corp. 166
Williams Mfg. Co., Hugh B. 133
Winer, Sam, Motors, Inc. 169
Witt-Armstrong Equipment Co. 171
Wyner, Gil, Co., Inc. 171

Yale & Towne Manufacturing Company 39

As rolling resistance decreases, operator of the 61 hp* International 460 can shift up and "throttle back" to maintain working speed while saving fuel. Your bigger, more costly power can be kept working more profitably on your earthmoving work.

Power-match your jobs with . . .

Cost-cutting drawbar power on rubber

Only International offers such a wide range of wheel tractor power sizes—allowing you to power-match your jobs and thus trim costs. In the heavy-duty class, for example, you can select from three power ratings: 61, 72.5, and 95 hp*, all with Multi-Range six-cylinder engines . . . gasoline, LP gas, or Diesel.

Multi-Range engine design and Torque Amplifier drive give an infinite range of work and travel speeds from less than one mph to 18 mph. You get bulldog lugging power for slow, heavy pulls. Throttle back and shift up for top fuel economy when the load is light.

An IH Dealer near your job will gladly demonstrate an International* 460, 560, or 660 or any others in the International line of eight sizes 13.4 to 95 hp*. For full-line catalog, write International Harvester Co., Dept. RS-1, P. O. Box 7333, Chicago 80, Ill.

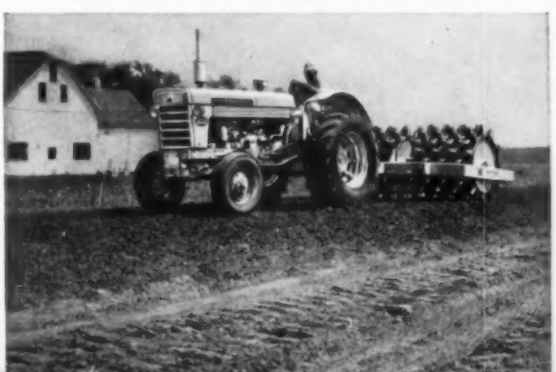
**Maximum engine horsepower at standard conditions*

INTERNATIONAL HARVESTER

. . . for more details circle 325 on enclosed return postal card

Self-loading in tough clay and shale, a 95 hp* International 660 heaps this 11-yd elevating scraper in 40 seconds. A combination like this slashes investment and operating costs on short-haul or clean-up work.

Compacting subgrade for a four-lane highway in Iowa, a 72.5 hp* International 560 handled this sheepsfoot roller 80 per cent faster than the power formerly used, according to the contractor.



"We drilled some of the West's toughest rock with Timken® carbide insert bits"

Special report from Morrison-Knudsen Co. Inc.

LOCATION:
RAILROAD RELOCATION,
WILLIAMS TO CROOKTON,
ARIZONA

Operating conditions:
Malpais

Carving out a railroad roadbed through tough malpais called for consistently high quality rock bits. Morrison-Knudsen selected Timken® removable carbide insert bits for the job and drilled over 3,000,000 ft. of hole in this volcanic formation — some of the toughest rock in the West. The carbide insert bit's 5-front hole design, pioneered by the Timken Company, assured excellent hole cleaning. And the special analysis carbide inserts took all the punishment of drilling in this basalt lava formation.

Which Timken Bit should you use?

For drilling hard, abrasive ground the Timken carbide insert bit gives you greatest economy. In softer ground, the low-cost Timken all steel multi-use bits having a shoulder drive can be used to best advantage. When harder and more abrasive rock is encountered, simply switch to Timken carbide insert bits. They fit the same drill steel. Let our rock bit experts help you select the right Timken bit for your job. The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.*

TIMKEN®
removable rock bits

. . . for more details circle 350 on enclosed return postal card